Guyot

Technical Paper 308

DEPARTMENT OF THE INTERIOR
ALBERT B. FALL, SECRETARY

U.S. BUREAU OF MINES
H. FOSTER BAIN, DIRECTOR

U.S. Bureau of mines.

ANALYSES OF KENTUCKY COALS

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1922

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First edition, September, 1922.

PREFACE.

One of the important functions of the Bureau of Mines has been the analysis of samples of coal from every coal-mining State and from Alaska. These analyses are being published for the information of Government officials and the public.

The samples have been collected in mines by representatives of the Bureau of Mines, and by geologists of the United States Geological Survey in investigations of mineral resources; they have been collected from coal delivered for the use of Government Departments—Treasury, Navy, and War—and for the various Government institutions; they have also come from coal obtained for tests by the bureau in investigations of fuel utilization and the explosibility of coal dust. Extensive sampling and analytical work has been done in connection with various State geological surveys.

From time to time the bureau has published the analytical results in large bulletins. Although the analyses in any one bulletin have been grouped by States, or by special uses, to look up the analyses of coals from any particular section of the country necessitates the perusal of a number of bulletins, some of which are no longer available for free distribution.

Moreover, when the bureau receives an inquiry for analyses of coal from any particular part of the country, it constitutes a large wastage of printed documents to send a number of superfluous bulletins in order to show the analyses for only a particular mining district in a State, or even for an individual mine. It therefore is deemed expedient to republish the analyses of coal in a series of inexpensive publications, by separate States, or if the coal production is small in any State, by adjacent States, and to include a brief description of the geologic structures of the coal basins in the State, or group of States, abstracted from the reports of the United States Geological Survey, together with a brief description of the typical mining conditions in the different districts; also a statement of the production by counties or districts as compiled by the United States Geological Survey.

Technical Paper 269 was the first of the series to be issued; this paper on Kentucky coals is the second. From time to time the various papers will be revised to include later analyses.

H. Foster Bain,
Director.

ANALYSES OF KENTUCKY COALS.

INTRODUCTION.

By G. S. Rice.[1]

The first record of coal mining in the State of Kentucky is for 1828, when 328 tons were mined. From that year the development of the fields gradually increased until 1907, when the production reached 10,750,000 net tons. The rapid development since 1907 to 1918 is due to the extension of railroads farther into the coal fields and the introduction of improved mining machinery. In 1918 the output reached 31,530,000 net tons, ranking the state fifth in production of coal in the United States. The figures for coal production (short tons) by decades are as follows:[2]

Decade.	Output.
1828 to 1837	40, 678
1838 to 1847	606, 027
1848 to 1857	1, 775, 000
1858 to 1867	2, 420, 760
1868 to 1877	3, 861, 382
1878 to 1887	13, 661, 473
1888 to 1897	30, 024, 339
1898 to 1907	70, 014, 905
1908 to 1917	180, 672, 470

MINING REGIONS.

The coal regions cover an approximate area of 15,000 square miles and are divided in two separate fields—an eastern field of 10,400 square miles and a western field of 4,600 square miles. Figure 1 shows the areas of the two fields.

The eastern field comprises 37 counties that have for their eastern boundary the State line; the western boundary of the field extends across the State through Greenup, Carter, Rowan, Menefee, Powell, Estill, Madison, Rockcastle, Pulaski, Wayne, and Clinton Counties. The coals of this field are a part of the Appalachian Basin and are generally high in volatile matter, low in sulphur and ash, and relatively high in heating value. The Harlan, Hazard, Hignite, and Millers Creek coals are known as block and splint.

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[1] Chief mining engineer, Bureau of Mines.

[2] Compiled from Mineral Resources of the United States, U. S. Geol. Survey.

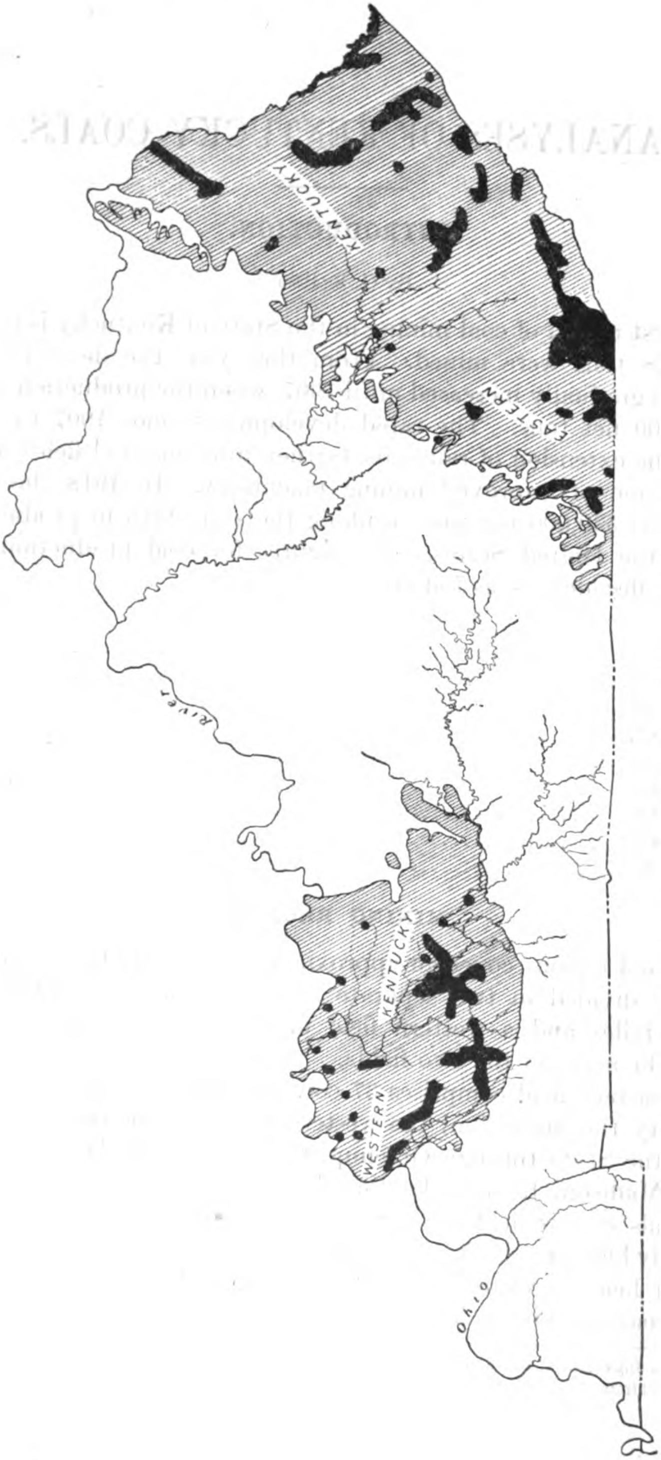

FIGURE 1.—Sketch map of Kentucky showing eastern and western fields and producing districts.

In the border counties on the west side of the eastern field and in those counties where transportation facilities are poor, mining is not carried on commercially, although coal is mined for domestic use.

In the western field the most mining is done in Christian, Daviess, Henderson, McLean, Muhlenberg, Ohio, Hopkins, Union, and Webster Counties, but coal is found in Crittenden, Todd, Logan, Butler, Warren, Edmonson, Hart, Grayson, Breckenridge, and Hancock Counties. The coals of this field are a part of the eastern interior basin, and are closely related to the coals of Illinois and Indiana. As compared to the coals of the eastern field, they are higher in moisture, ash, and sulphur, and lower in heating value.

GEOLOGY OF THE COAL FORMATIONS.[3]

By M. R. CAMPBELL.[4]

The two fields of Kentucky are not only widely separated geographically, but the quality of coals that they contain differs as do the succession of beds and the associated rocks; hence a direct comparison of the coal beds in the two fields is impossible.

The surface of each field may be classed as hilly, but that of the eastern field is much more rugged and the hills and ridges are much higher than those in the western field. The former is a deeply dissected plateau in which almost none of the original plateau surface is left, the crests of the ridges being narrow and almost of knife-edge sharpness. The valleys are equally narrow and V-shaped, with little if any level land in their bottoms, and the streams that carved them are generally swiftly flowing mountain torrents.

The hills and ridges rise 500 to 1,200 feet above the bottoms of the valleys, the greater height prevailing along the eastern boundary of the State and the lesser along the western margin of the field, where it overlooks the "Bluegrass" region. The deep and narrow valleys afford room for only a single railroad, and generally little space remains for the establishment of mining plants and the building of towns.

The western field is hilly, but the hills are smaller than those of the eastern field, and the valleys are generally much broader. The great breadth of some of the valleys is due to the fact that in recent geologic time a lake occupied them. Into this lake the streams poured their loads of sediment until the lake was filled, producing in some of the valleys broad plains above which rise the isolated hills. The filling of the valleys covered the outcrops of the coal beds, so that drilling is necessary more often than in the eastern field.

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[3] The geological description is freely borrowed from reports of the U. S. Geological Survey and the Kentucky Geological Survey.

[4] Coal geologist, U. S. Geological Survey.

GEOLOGIC FORMATIONS.

The coal-bearing rocks of the Kentucky fields are of upper Carboniferous or Pennsylvanian age, but as the two fields have not been examined and mapped systematically, the minor subdivisions, where such subdivisions have been made, are not the same; hence the name of the geologic formation within which a coal bed lies gives little information regarding its position in the geologic column, unless the reader happens to be familiar with the names used.

Ashley and Glenn,[5] working in the Middlesboro syncline, applied the following formation names:

Bryson formation,
Hignite formation,
Catron formation,
Mingo formation,
Hance formation,
Lee formation.

With the exception of Lee formation these names have not been used outside this district.

Near the northeast end of Pine Mountain, geologists working in the Virginian coal fields have carried at least to the State line, if not actually into Kentucky, the following names:

Harlan sandstone,
Wise formation,
Gladeville sandstone,
Norton formation,
Lee formation.

On the border line adjacent to Ohio and West Virginia, the geological surveys of the two States have carried and used the Pennsylvania nomenclature as follows:

Dunkard formation,
Monongahela formation,
Conemaugh formation,
Allegheny formation,
Pottsville formation.

In these formations the chief coal seams are found in the Pottsville and Allegheny and the lower part of the Conemaugh. Identification is given in the following table, using the Pennsylvania Survey nomenclature as primary designation. The numbers that have been applied to them by the Geological Survey of Kentucky are given also, with the local names by which the coals are known.

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[5] Ashley, G. H. and Glenn, L. C., Geology and mineral resources of part of the Cumberland Gap coal field, Kentucky: U. S. Geol. Survey, Prof. Paper 49, 1906, p. 33.

Coal beds found in eastern Kentucky, in order from upper to lower.

Hilton (Leslie County), Stamper (Letcher County).
Upper Freeport, No. 9, Hindman, High Splint.
Lower Freeport, No. 8, Francis.
Middle Kittanning, No. 7, Flag, Cornett.
Lower Kittanning, No. 6, Hazard.
Brookville, No. 5, Haddix, Pardee of West Virginia.
Broas, Winnifrede of West Virginia.
Hamlin.
Fire Clay Rider.
Upper Mercer, No. 4, Fire Clay, Dean, Hyden.
Wilson Fork.
Whitesburg.
Amburgy, Low Splint.
Big Branch.
Lower Mercer, No. 3, Elkhorn, Peach Orchard, Taggart.
Harlan.
Kelly.
Imboden.
Blue Gem (Upper Blue Gem).
Bacon Creek (Lower Blue Gem).
Quakertown, No. 2, Van Lear, Lewis.
Sharon, No. 1, Dwale.

The beds from the Upper Freeport down to the Upper Mercer are generally of workable thickness throughout all the counties of the eastern field. In the southern part of the field the Coal Measures thicken, and many other workable beds are found that are not represented in the northern part where the same formations are much thinner. These additional beds occur mainly between the Upper Mercer and Quakertown beds, but some are found below the Sharon No. 1, in Pike County.

Cannel coals occur in thin beds throughout the eastern field. Workable beds ranging in thickness up to about 48 inches are found in Bell, Breathitt, Carter, Floyd, Magoffin, Leslie, and Johnson Counties. They are used as an enricher in the manufacture of illuminating gas and for domestic purposes.

In the western field Glenn[6] has applied the following names:

Dixon formation,
Lisman formation,
Mulford formation,
Dekoven formation,
Tradewater formation,
Caseyville conglomerate.

The chief coal beds—Nos. 9 and 11—are in the Mulford formation. Of these two, the lower, or No. 9, is the more persistent and reliable for mining; it has a constantly uniform thickness of about 54 inches.

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[6] Glenn, L. C. Coals of the Tradewater River Region: Kentucky Geol. Survey, Bull. 17, 1912, plate.

No. 11 is 60 to 72 inches thick. These two beds belong in the Carbondale or Allegheny formations and are the mainstay of the coal-mining industry of Webster County. They furnish almost all the commercial output of Hopkins, Muhlenberg, Webster, Union, Ohio, Henderson, McLean, and Daviess Counties.

In Christian and Hancock, the other counties of the western field in which commercial mining is done, the beds worked have not yet been definitely located in the stratigraphic series, though they are known to belong between the Caseyville conglomerate and the No. 9 coal.

The other workable beds in the western field are not definitely correlated with the known beds. They are mined chiefly for domestic use and comprise the Mannington or Empire, Lewisport, Hawesville, Nolin River, and DeKoven beds.

MINING METHODS.

By C. A. Herbert.[7]

EASTERN KENTUCKY.

The beds now worked in the eastern Kentucky field are all on, close to, or above drainage, and as a result the mines are developed by slopes or drifts. The custom, in accord with good engineering practice, has been to work the overlying beds first, hence the majority of the mines are in beds considerably above tipple height, making necessary the lowering of the coal from the mines to the railroad cars. A variety of schemes for lowering the coal are used, the particular one adopted depending on the local conditions and on the choice of the operator; they include gravity planes—on which the mine cars are lowered from the mine to the tipple at the railroad—and monitor planes, aerial tramways, retarding conveyers, and chutes, by which the coal is lowered from the tipple at the mine to the loading bins at the railroad.

All mines are worked by the room and pillar method. As a rule, the room entries are driven on the butt cleats and the rooms on face cleats of the coal. When this is not practicable, particularly in mines working beds near the top of the mountains where the coal is only in the ridges, it is necessary to plan the workings to extract these irregular-shaped tracts to the best advantage irrespective of the direction of the coal facings. In such mines it is customary to drive rooms from each of the room entries. In some of the larger mines in the lower and more continuous beds, however, this practice is being discontinued, and the rooms are being turned from but one entry and in the same direction, as this plan gives a much better break line on pillar work and better recovery of the chain pillars.

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[7] Mining engineer, Bureau of Mines.

The general practice in the eastern field is to attempt to recover the pillar coal, and hence there is a tendency to decrease the width of the rooms and to increase the width of the pillars. The recovery of coal ranges from 50 to 90 per cent, depending on the natural conditions and how well the workings are laid out to meet them. The average recovery is about 75 per cent and will doubtless increase as the companies now obtaining the lower extraction follow the practice of the more progressive companies.

The natural conditions throughout eastern Kentucky are very favorable to a high recovery, the mines, though generally moist, are practically free from water and gas, and the roof is universally good.

At some of the mines regular systems of timbering are in use, props and timbers being set at stated intervals as the workings advance and later withdrawn as the pillar coal is recovered. At other mines, on account of the excellent roof, few props or timbers are required in the advance work and are used only during the recovery of pillars.

In general, the mines are well equipped. Practically all the coal, both in the advance and in the pillar work, is undercut with shortwall mining machines. The main haulage is universally by electric locomotives, and in many mines the gathering is also by electric locomotive.

WESTERN KENTUCKY.

The mining methods of the western Kentucky field differ from those of the eastern field in that little or no attempt is made to recover the pillar coal, and the mines are laid out to conform to the dip of the coal measures, which ranges from practically horizontal to 8 or 10°.

As the beds worked in western Kentucky lie close to or below drainage, the mines are developed by drift slopes or shafts. Where the beds dip it is customary to drive the rooms up the rise from the upper of the two butt entries; where the beds lie nearly flat, rooms are turned from both entries. As little or no attempt is made to recover pillar coal, the pillars are only just thick enough to support the roof. The recovery of coal averages about 60 per cent.

Most of the coal is undercut with electric chain machines, although a considerable proportion is shot from the solid. Haulage is by rope, electric locomotives, and mules.

USE AND DISTRIBUTION OF THE COAL PRODUCED.

By F. G. Tryon.[8]

The same sharp division between east and west which marks the geology of the coals of Kentucky extends to the commercial affiliations of the producing fields and to the uses to which the coals are put. Broadly speaking, the coals of western Kentucky are chiefly in demand for steam raising, whereas the most important demands for eastern Kentucky coals come from makers of by-product coke and illuminating gas. Railroad fuel is the chief avenue of consumption for the western Kentucky coals, but is only a minor avenue for those of eastern Kentucky. In both the eastern and the western fields the sales to retail coal dealers for domestic use form an unusually large proportion of the total.

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[8] In charge coal and coke statistics, U. S. Geological Survey.

COKING COAL.

The coals of eastern Kentucky, when mixed with the proper proportion of low-volatile coal, are peculiarly suited to the manufacture of by-product coke. An investigation made by the engineers of the United States Fuel Administration showed that, in 1917, 87 per cent of the northeast Kentucky production, 52 per cent of the Hazard production, and 44 per cent of the production of southeast Kentucky was suitable for making such coke. A list of mines producing satisfactory coal was prepared by a committee of the Fuel Administration staff familiar with by-product coke-oven practice, after correspondence with all the operators of by-product ovens and many producers of coal. The production of these mines for 1917 was reported to the Geological Survey, as follows:

Output, in 1917, of Kentucky coal fields.

District.	Total output, all mines.	Output of mines listed as producing coal suitable for manufacture of by-product coke.		
		First grade.	Second grade.	Total.
Northeastern Kentucky	6,453,679	5,389,454	196,713	5,586,167
Hazard	1,853,353	878,009	92,902	970,911
Southeastern Kentucky	6,381,144	3,747,724	544,286	[a] 4,292,010
Tennessee and Georgia	6,313,249			
Western Kentucky	10,249,480	293,539	....	293,539

[a] Separation of the two districts can not be made exactly, but about 2,800,000 tons, or 65 per cent of the total, was produced in southeastern Kentucky.

In western Kentucky, as the table shows, the quantity of coal deemed suitable for use in by-product ovens was small. Progress in the technique of coke-oven practice may, of course, render available other coal not now considered valuable for by-product use, thus increasing the tonnages shown in the table.

Largely as a result of the expansion of the by-product coke industry, the production of coal in eastern Kentucky has grown by leaps and bounds. In fact, the field has developed more rapidly than any other major field. The average output for 1916–1920 was more than 13 times as great as the average for 1890–1900, whereas the growth in bituminous output as a whole during the same period was less than fourfold. One consequence of this extraordinary growth has been a development of mine capacity far in excess of the ability of the railroads to transport, so that eastern Kentucky is the scene of chronic transportation difficulties whenever the demand for coal is active.

Kentucky has for many years been a small but regular producer of beehive coke. In 1918 there were 798 beehive ovens in operation in the State, and a production of 301,036 tons was reported, most of it from the eastern part of the State.

TRADE DISTRICTS.

Although the mines of western Kentucky are considered a unit in the coal trade, those in the eastern part of the State are commonly grouped in three producing fields—northeastern Kentucky, the Hazard field, and southeastern Kentucky. In the accompanying tables the markets of each of these fields are analyzed, first by class of consignee, and then by geographical destination. The data on distribution by destination cover 1917, a more representative year than 1918, data for which are also available, because of the movement of coal being artificially controlled in 1918 by the zone system established by the Fuel Administration.

NORTHEASTERN KENTUCKY.

Northeastern Kentucky, otherwise termed the Big Sandy or Elkhorn field, comprises mines in Boyd, Floyd, Carter, Johnson, Knott, Lawrence, and Letcher Counties. It does not include the mines in Martin and Pike Counties, Ky., on the west bank of Tug River, which are commercially a part of the Kenova-Thacker field, otherwise known as the Williamson field. The trade affiliations of the Kenova-Thacker field are such that it is usually grouped with the high-volatile fields of southern West Virginia.

The largest elements in the demand for coal from the Big Sandy-Elkhorn field are by-product coke ovens, coal-gas plants, and steel works using gas coal. The coal is too valuable for wide use as railroad fuel, and the proportion used as such is 7 or 8 per cent of the total output as against an average of 28 per cent for the output of the United States. Because of its being hard and lumpy, the coal is suitable for domestic use, and from 10 to 15 per cent of the output is shipped to retail dealers. The geographical position of northeastern Kentucky prevents shipments eastward, and the great bulk of the production moves north and west across the Ohio River. About 53 per cent of the tonnage is consumed in the States of Illinois, Indiana, Michigan, and Ohio; 13 per cent is shipped to Lake

Erie for movement by vessel up the Lakes, and a small amount (in 1917 about 12 per cent of the total) moves to points west of the Mississippi. A little beehive coke is made in Boyd County.

SOUTHEASTERN KENTUCKY.

Mines in Bell, Clay, Knott, Laurel, McCreary, Whitley, and Harlan Counties are grouped as the southeastern Kentucky field. Their output is used for the same purposes as that of the northeastern district, except that a larger proportion is used as railroad and domestic fuel and a smaller proportion for gas, by-product, and general industrial purposes. Geographically, southeastern Kentucky coal has a wide market. Although little of it reaches the Great Lakes, about 23 per cent is shipped north and west to the States of Illinois, Indiana, Ohio, and Michigan, and 4 per cent to points west of the Mississippi. Southeastern Kentucky also makes heavy shipments east and south. In 1917, 21 per cent of the total was shipped to the Atlantic coastal plain, and a few carloads even reached tidewater for export. Another 7 per cent moved southwest into Tennessee. In Harlan County a small quantity of beehive coke is made.

HAZARD FIELD.

The mines in Perry, Breathitt, and Lee Counties form a trade group centering about Hazard, in Perry County, although the Hazard field is sometimes grouped with northeastern Kentucky. The chief demand comes from the retail coal trade, where the free-burning and blocky Hazard coal finds ready sale. It is also well adapted to the manufacture of illuminating gas and by-product coke. The movement out of the Hazard field is entirely north and west; 8 to 12 per cent of the total is shipped to the Lakes, and 47 per cent is consumed in the three States—Ohio, Indiana, and Michigan.

WESTERN KENTUCKY.

Like the eastern interior region as a whole, of which it forms a part, the western Kentucky field produces railroad fuel chiefly; 30 to 35 per cent of the entire output of the district being used by railroads, a proportion somewhat above that for all bituminous coal mines in the United States. Little coal from west Kentucky is sold for the manufacture of gas, although about 12 per cent of it is taken by electric light and power companies. The district produces also a lump coal that finds a wide market for domestic use, and about one-fourth of the output is shipped to retail dealers. A little coking coal is produced. In 1918 there were 155 beehive ovens in the field, with an output of about 25,000 tons of coke. The Fuel Administration classified about 3 per cent of the 1917 output (204,000 tons) as high-volatile by-product coking coal.

Distribution, by classes of consignees, of coal shipped from Kentucky mines, August 3, 1918, to February 1, 1919.[a]

Class of consingee.	Per cent of total shipments from— North-eastern Kentucky.	South-eastern Kentucky.	Hazard field.	Western Kentucky.
Railroad fuel	6.5	17.9	13.7	35.2
Lake	13.5	4.0	13.1	...
Tidewater	...	1.3	...	...
United States Government institutions	.1	.5	.6	1.3
State and county institutions	.5	.2	.5	1.3
Gas and electric public utilities	14.7	10.4	6.7	12.4
Retail coal dealers	13.4	23.9	38.4	25.4
Industrial plants including iron and steel	51.3	41.8	27.0	24.4
Total shipments	100.0	100.0	100.0	100.0

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[a] Lesher, C. E.: Distribution and Consumption of Coal in 1918, Mineral Resources, 1918, U. S. Geol. Survey, 1921, p. 1373.

Distribution by destination of coal produced in Kentucky in calendar year 1917.[a]

(Net tons.)

State.	North-eastern Kentucky.	South-eastern Kentucky.	Hazard field.	Western Kentucky.	Total.[b]
Used in Kentucky:					
Sold to local trade, not shipped	103,779	124,846	41,362	532,654	802,641
Used at mines for steam and heat	128,077	113,333	10,371	344,616	596,397
Made into coke at mines	198,934	279,623	...	121,059	599,616
Shipped to Kentucky points	384,611	949,480	102,018	1,988,171	3,424,280
	815,401	1,467,282	153,751	2,986,500	5,422,934
Shipped to other States:					
Alabama	...	50,000	...	100,000	150,000
Arkansas	...	...	...	102,000	102,000
Florida	3,000	44,000	...	...	47,000
Georgia	...	1,070,000	...	...	1,070,000
Illinois	428,000	228,000	25,000	447,000	1,128,000
Indiana	900,000	338,000	172,000	720,000	2,130,000
Iowa	198,000	36,000	...	63,000	297,000
Kansas	27,000	27,000	...	15,000	69,000
Louisiana	...	81,000	...	669,000	750,000
Michigan	797,000	445,000	295,000	...	1,537,000
Minnesota	195,000	33,000	...	...	228,000
Mississippi	...	...	...	551,000	551,000
Missouri	270,000	16,000	...	214,000	500,000
Nebraska	45,000	...	...	36,000	81,000
New Jersey	...	...	...	...	...
New York	...	...	...	...	...
North Carolina	15,000	91,000	...	...	106,000
Ohio	1,265,000	477,000	784,000	30,000	2,556,000
Pennsylvania	...	...	...	...	...
South Carolina	...	72,000	...	...	72,000
South Dakota	60,000	24,000	...	3,000	87,000
Tennessee	2,000	459,000	...	1,192,000	1,653,000
Texas	...	27,000	...	42,000	69,000
Virginia	...	10,000	...	...	10,000
Wisconsin	25,000	57,000	...	110,000	192,000
	4,230,000	3,585,000	1,276,000	4,294,000	13,385,000
Delivered to railroads by all-rail routes	514,675	1,103,865	254,836	2,966,930	4,840,306
Exported by rail	37,000	4,000	3,000	...	44,000
Shipped to tidewater	...	36,000	...	2,050	38,650
Shipped to Great Lakes for cargo, or for vessel fuel	856,603	184,397	147,766	...	1,188,766
Total	6,453,679	6,381,144	1,835,353	10,249,480	24,919,656

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[a] Distribution and Consumption of Coal in 1917, by Lesher, C. E., Mineral Resources, 1917, U. S. Geol. Survey, 1920, pp. 1229–1231.

[b] Does not include output of small mines or of mines in Martin and Pike Counties on Kentucky side o Kenova-Thacker field in valley of Tug River.

FUSIBILITY OF ASH.

By A. C. FIELDNER,[8] H. M. COOPER,[9] and F. D. OSGOOD.[10]

With regard to fusibility of ash the coals of the United States are divided by the Bureau of Mines into three groups, as follows: Class 1, refractory ash, softening about 2,600° F.; class 2, ash of medium fusibility, softening between 2,200° F. and 2,600° F.; class 3, easily fusible ash, softening below 2,200° F.

The coals of eastern Kentucky include members of each class; those of the southeastern fields are generally in classes 1 and 2; those of the northeastern fields are in classes 2 and 3; and those of the western field are generally in class 3.

The softening temperature of ash of the coal from different mines, as far as tests have been made, is given in the table with the chemical analyses.

ACKNOWLEDGMENTS.

Special acknowledgment is due to Mr. W. R. Jillson, director and geologist of the Kentucky Geological Survey, for valuable suggestions and information, and to Mr. J. A. Alt, Mr. C. P. Scanlon, clerk computers, and Miss E. L. Jones, typist, for the work of computing and tabulating of the analyses.

CHEMICAL ANALYSES OF MINE SAMPLES.

By A. C. FIELDNER, H. M. COOPER, and F. D. OSGOOD.

The chemical analyses tabulated in this paper are taken from bulletins of the Bureau of Mines and publications of the Kentucky Geological Survey, and include analyses of mines sampled between July 1, 1919, and January 1, 1922, which are published for the first time in this paper.

The methods used by the Kentucky Geological Survey are similar to the standard methods of the Bureau of Mines, except for calorific value determination. Nearly all calorific values credited to the Kentucky Geological Survey were determined with the Parr peroxide calorimeter, and therefore they are not strictly comparable to the determinations made by the Bureau of Mines, which were made with an oxygen-bomb calorimeter by the standard method.

The reports and bulletins of the Kentucky Geological Survey contain many analyses of samples of different coal beds, some taken from local entries, and a great many more from outcrops, in the course of field surveys of the coal regions of the eastern part of the State. Many of the analyses of these outcrop samples, published in reports of the Kentucky Geological Survey for the different regions, are omitted here because the inferior quality of the outcrop coal is liable to give a wrong impression as to the grade that may be produced. Those analyses of outcrop coal that are given have been selected in order to give some information on the various coal beds that extend generally through the whole eastern Kentucky field; they must be regarded as showing only that good coal in workable beds is available for future development.

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[8] Supervising fuels chemist, U. S. Bureau of Mines.

[9] Chemist, U. S. Bureau of Mines.

[10] Assistant chemist, U. S. Bureau of Mines.

Analyses made by the Kentucky Geological Survey prior to 1890 are all given on the air-dried condition. In the early days of coal analysis no special precaution was taken to prevent a sample from losing moisture in transit to the laboratory, hence air-dry loss figures would be erroneous, and the "as received" condition of the coal of little value. The same statement holds true for nearly all of the Kentucky Geological Survey analyses that are tabulated as of later dates than 1890, for many of those samples were stored in sacks and open containers for several months before being analyzed.

No attempt has been made in the tables to show the analyst, or particular authority, for each analysis, other than the agency publishing the results. All the analyses of the Kentucky Geological Survey were made in the State laboratories by the State chemist and his assistants. Analyses credited to the Bureau of Mines were made at the coal laboratories of the bureau, at Pittsburgh, Pa., and Washington, D. C. Analyses credited to the United States Geological Survey were made at the fuel-testing plant at St. Louis, Mo., were published in various bulletins and professional papers of the survey and later incorporated in Bulletin 22 of the Bureau of Mines. The dates of the authority are the dates of publications, not the actual dates of analysis.

The analyses credited to the Kentucky Geological Survey are taken from the following survey reports: Chemical Analyses, part 1, 1890; Coals of the Licking Valley Region, Bull. 10, 1910; Coals from the Three Forks of the Kentucky River, Bull. 11, 1910; Progress of the Survey 1908 and 1909, published in 1910; Coals from Quicksand Creek and its tributaries, Bull. 18, Serial 25, 1912; Coal field adjacent to Pineville Gap, in Bell and Knox Counties, Bull. 14, Serial 17, 1912; Upper Cumberland coal field, Poor and Clover Forks in Harlan and Letcher Counties, Bull. 13, Serial 13, 1912; Coals of the Tradewater River Region, Bull. 17, 1912; Central City, Madisonville, Calhoun, and Newberg Quadrangles, Bull. 19, Serial 26, 1912; Kentucky Geological Survey Report: 4 series, vol. 1, pt. 1, pt. 2, 1913; Coals from Letcher County: 4 series, vol. 4, pt. 1, 1916; Coals from Goose Creek and its tributaries, Clay County: 4 series, vol. 4, pt. 3, 1918; Coals from the North Fork of the Kentucky River in Perry and portions of Breathitt and Knott County: 4 series, vol. 3, pt. 3, 1918; Coals of the Middle Fork of the Kentucky River: 4 series, vol. 5, pt. 1, 1918; Coals and structures of Magoffin County: 4 series, vol. 5, pt. 2, 1919; Geology of Kentucky: 5 series, Bull. 2, 1919.

Those analyses credited to the Bureau of Mines from: Bull. 22, 1913; Bull. 85, 1914; Bull. 119, 1918; Bull. 123, 1918; Bull. 193, 1922. Titles of these bulletins are given on page 91.

DELIVERED COAL.

By N. H. SNYDER.[11]

In recent years the Government and other large consumers of coal have appreciated more and more the desirability of determining accurately, by chemical analyses and other tests, the character and quality of coal delivered to the consumer. The increasing price of coal and the possible lowering in the quality delivered, due to careless or inefficient mining and preparation, point forcibly to the need of care in purchasing coal and of definite information on the quality actually delivered.

Many analyses of mine samples of coal are available, but available analyses of delivered coal are relatively few. In using coal analyses it should be recognized that there is a decided difference between mine samples and samples from deliveries.

Mine or face samples of coal from parts of all the coal fields in the United States have been collected and their analyses published by the Bureau of Mines, the United States Geological Survey, and some of the State surveys. Mine samples are collected according to a standard method.[12] the essential feature of which is cutting a channel measuring 2 by 6 inches or 3 by 4 inches from roof to floor in the face of the seam, and excluding from the sample all partings more than three-eighth inch thick, and all lenses or concretions of "sulphur," or other impurities, more than 2 inches in maximum diameter and one-half inch thick.

Analyses of mine samples form a permanent or scientific record of the coal bed at the point sampled. Mine samples are important for determining the character of the coal in any given mine or district, and to the experienced purchaser who has knowledge of the impurities in the bed and the degree to which these are eliminated in the mining and preparation of the coal they may serve as a sufficient guide in the purchase of coal. An average purchaser, however, unacquainted with these details may be misled by dependence on mine samples. The quality of coal indicated by the mine samples can rarely if ever be attained in the coal delivered, but the mine samples taken in a standardized manner are valuable as showing to the operator whether or not his mine is being efficiently worked and whether the preparation of the coal is being properly done, the latter point involving the question whether he has suitable mechanical appliances for separating the impurities. Usually analyses of face samples and delivered samples vary widely if the coal bed impurities are friable or the roof and floor are friable or soft, so that the impurities become mixed with the coal in blasting and shoveling at the face, whereby the ash content of the coal loaded is increased and its quality lowered.

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[11] Engineer in charge fuel inspection, Bureau of Mines.

[12] Holmes, J. A., The sampling of coal in the mine; Technical Paper 1, Bureau of Mines, 1918, 18 pp.

Although certain impurities are eliminated from the formally prepared mine sample, these may not be eliminated by the miner in the production of large tonnage. If the roof and floor are friable or soft, pieces of them may be included in the coal shipped. When prices are high and competition is not keen it is easy for both the miner and the management to lower the standard of preparation of the coal, and the return to a high standard is always difficult. Moreover, some analyses in geological reports are of samples taken either of outcrop coal or of small workings not beyond the influence of weathering.

The Bureau of Mines, recognizing the need of protection against the delivery of coal containing undue amounts of impurities, developed specifications for the purchase of coal; they require a guaranteed analysis and contain premium and penalty clauses. Other large consumers of coal have developed similar specifications, and during recent years many purchasers have obtained coal through the "pools" established during the war at Atlantic tidewater points. These pools, intended primarily to conserve railroad equipment and expedite the loading of vessels, were imperfect and unscientific in their grouping of coals, and their use by so many purchasers shows the need for more definite information on the quality of delivered coal.

In sampling delivered coal the Bureau of Mines follows a definite procedure.[12] A sample weighing not less than 1,000 pounds is systematically collected by taking equal increments at regular intervals throughout the delivery, while coal is being loaded or unloaded, and crushing and reducing this sample by successive stages to laboratory size.

In using analyses of samples of delivered coal, the reader must recognize that the coal is not always of uniform size, and that the impurities are not uniformly distributed throughout the mass. Some variation in the results obtained are consequently to be expected; if the same mass of coal were sampled a number of times the analyses would not agree absolutely except by chance. It is only when a considerable number of such analyses are available representing a considerable tonnage mined over a period of time that the average value and range of variation of a particular coal become known with assurance. With reasonable tolerances, however, for these variations, delivered coal can be sampled accurately enough for all practical purposes.

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[12] Pope, G. S., Methods of sampling delivered coal and specifications for the purchase of coal for the Government: Bull. 116, Bureau of Mines, 1918, pp. 13–30. Pope, G. S., Directions for sampling coal for shipment or delivery: Tech. Paper No. 133, Bureau of Mines, 1917, pp. 5–12.

Deliveries from any one mine may vary in quality from time to time because of changes in mining or preparing the coal, and an analysis of deliveries for any one date should not be considered as establishing a permanent standard, for the output may be greatly improved by new methods of mining and preparation, or it may deteriorate through the carelessness of the miner and the operator.

The analyses of delivered coal that are tabulated on a later page represent samples collected by representatives of the various departments of the Government under the direction of the Bureau of Mines, from coal delivered to the Government under contract, and also samples collected by representatives of the Bureau of Mines from coal being delivered to railroad cars at mine tipples. The former samples were collected systematically throughout the entire delivery, and the latter were collected systematically through an entire day's run at the mine. These analyses of delivered coal indicate more nearly the grade a consumer is likely to receive, but very careful consideration must be given the amount of coal represented and the number of analyses made.

TABLE 1.—*Chemical analyses of mine samples.*

EASTERN KENTUCKY FIELD.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature[d] (° F.).	Authority[e] and year.
	Laboratory No.	Kind.[a]	Condition.[b]	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.[c]	British thermal units.		
BELL COUNTY.																	
Arjay; Glendon mine, Straight Creek bed (face of 8 right entry, 3,400 feet from mine mouth).	21557	A	1	3.0	38.9	56.0	2.1	1.1	......	......	......	......	1.1	7,961	14,330	2,100	Bureau of Mines, 1918.
Same (face of 12 right entry, 4,200 feet from mine mouth).	21558	A	1	2.7	38.4	56.1	2.8	.8	......	......	......	......	1.2	7,911	14,240	2,190	Do.
Same (face of 7 right entry, 2,000 feet from mine mouth).	21559	A	1	2.9	37.3	55.7	4.1	.8	......	......	......	......	.9	7,778	14,000	2,100	Do.
Same (face of 4 right entry, 3,200 feet from mine mouth).	21560	A	1	3.1	38.1	55.6	3.2	.7	......	......	......	......	1.1	7,856	14,140	2,130	Do.
Same (composite of samples 21557 to 21560, inclusive).	21561	A	1	3.0	37.8	56.3	2.9	1.0	5.7	79.4	2.0	9.0	1.1	7,889	14,200	....	Do.
			2	......	38.9	58.1	3.0	1.0	5.5	81.8	2.0	6.7	......	8,133	14,640	....	
			3	......	40.1	59.9	......	1.0	5.7	84.4	2.1	6.8	......	8,383	15,090	....	
Same (rib of main entry, near face)....	81264	A	1	3.9	37.3	57.0	1.8	.7	......	......	......	......	2.3	7,911	14,240	2,110	Bureau of Mines.
Same (face of 14 right heading, 4,500 feet northwest of mine mouth).	81265	A	1	3.3	38.3	57.1	1.3	.8	......	......	......	......	1.6	7,978	14,360	2,090	Do.
Same (face of 13 left air course, 4,000 feet northwest of mine mouth).	81266	A	1	3.4	38.2	56.9	1.5	.8	......	......	......	......	2.1	7,989	14,380	2,070	Do.
Same (7 right entry, rib of pillar at 8 room).	81267	A	1	3.4	37.1	57.2	2.3	.8	......	......	......	......	1.8	7,867	14,160	2,040	Do.
Same (composite of samples 81264 to 81267, inclusive).	81268	A	1	3.2	37.9	57.1	1.8	.9	5.9	79.6	2.0	9.8	2.0	7,928	14,270	....	Do.
			2	......	39.2	59.0	1.8	.9	5.7	82.2	2.1	7.3	......	8,189	14,740	....	
			3	......	39.9	60.1	......	1.0	5.8	83.7	2.1	7.4	......	8,344	15,020	....	

[a] The kind of sample is denoted by letter as follows: A, mine sample collected by an inspector of the Bureau of Mines; B, mine sample collected by a geologist of the United States Geological Survey; D, mine or car samples not collected by A or B.

[b] The form of analysis is denoted by number as follows: 1, sample as received; 2, dried at a temperature of 105° C.; 3, moisture and ash free; 4, air-dried condition.

[c] Calorific values by the Kentucky Geological Survey, marked *, were made in a Parr peroxide calorimeter; all others were made in an oxygen-bomb calorimeter.

[d] Softening temperature denotes the temperatures, ° F., at which a cone of the coal ash will fuse down to a spherical lump when heated in the furnace.

[e] All analyses marked Bureau of Mines and U. S. G. S. were analyzed by the bureau's standard methods; all others were analyzed by methods closely approximating these methods in the laboratory of the Kentucky Geological Survey. The year refers to the date when the analyses were originally published; analyses without date are published for the first time.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BELL COUNTY—continued.																	
Balkan; Balkan or Black Mountain mine, Creech bed (face of 10 right entry, 1 main entry, 4,500 feet southeast of mine mouth).	81399	A	1	1.7	37.6	57.0	3.7	.7	......	......	......	......	.6	7,861	14,150	2,510	Bureau of Mines.
Same (face of 1 main entry, 5,500 feet southeast of mine mouth).	81400	A	1	2.3	37.6	55.5	4.6	.8	......	......	......	......	1.0	7,772	13,990	2,510	Do.
Same (face of 12 left entry, 1 main entry, 5,400 feet southeast of mine mouth).	81401	A	1	2.5	27.6	55.7	4.2	.8	......	......	......	......	.8	7,783	14,010	2,540	Do.
Same (on rib near face of 5 left air course, 3 main entry).	81402	A	1	2.5	36.5	56.7	4.3	1.1	......	......	......	......	1.1	7,761	13,970	2,580	Do.
Same (face of 5 main entry, 3,800 feet northeast of mine mouth).	81403	A	1	2.9	36.3	54.5	6.3	1.5	......	......	......	......	1.5	7,572	13,630	2,410	Do.
Same (face of 2 right entry, 4 main entry, 4,200 feet southwest of mine mouth).	81404	A	1	2.3	37.7	56.0	4.0	.8	......	......	......	......	.9	7,844	14,120	2,510	Do.
Same (pillar of 1 room, 6 right entry, 1 main entry).	81405	A	1	2.4	37.2	56.4	4.0	1.4	......	......	......	......	1.1	7,756	13,960	2,570	Do.
Same (composite of samples 81399 to 81405, inclusive).	81406	A	1	2.6	37.2	55.8	4.4	1.1	5.6	78.4	1.8	8.7	1.0	7,777	14,000	......	Do.
			2	......	38.2	57.3	4.5	1.1	5.4	80.5	1.9	6.6	......	7,989	14,380	......	
			3	......	40.0	60.0	......	1.2	5.7	84.3	1.9	6.9	......	8,367	15,060	......	
Cardinal; Cardinal mine, Harlan bed (face of 6 right air course).	81407	A	1	1.9	38.5	56.4	3.2	1.0	......	......	......	......	.8	7,856	14,140	+2,740	Do.
Same (face of 7 right entry)	81408	A	1	2.6	37.8	55.9	3.7	.9	......	......	......	......	1.4	7,800	14,040	+2,740	Do.
Same (face of 5 right entry)	81409	A	1	3.1	37.4	56.2	4.3	.9	......	......	......	......	1.0	7,722	13,900	2,510	Do.
Same (face of 2 main entry)	81410	A	1	1.8	38.6	55.4	4.2	.9	......	......	......	......	.7	7,806	14,050	+2,740	Do.
Same (composite of samples 81407 to 81410, inclusive).	81411	A	1	2.1	38.3	55.9	3.7	.8	5.6	78.6	2.0	9.3	1.0	7,817	14,070	......	Do.
			2	......	39.1	57.1	3.8	.8	5.5	80.4	2.0	7.5	......	7,983	14,370	......	
			3	......	40.6	59.4	......	.9	5.7	83.5	2.1	7.8	......	8,300	14,940	......	
Cary; Cary No. 2 mine, Straight Creek bed (entry rib, near face of 1 west main entry).	81269	A	1	3.3	39.3	54.7	2.7	.9	......	......	......	......	2.0	7,839	14,110	2,220	Do.
Same (on rib, near face of air course, 1 west main entry).	81270	A	1	3.2	38.6	55.8	2.4	.9	......	......	......	......	1.9	7,851	14,130	1,990	Do.

Same (rib of break through, 2 left entry, 1 main entry).	81271	A	1	3.2	38.0	56.9	1.9	.7	......	......	......	......	1.7	7,933	14,280	2,110	Do.
Same (on rib near face, 2 right entry, 1 main entry).	81272	A	1	3.0	38.8	56.6	1.6	.7	......	......	......	......	1.4	7,972	14,350	2,090	Do.
Same (composite of samples 81269 to 81272, inclusive).	81273	A	1	3.0	38.9	56.0	2.1	.9	5.8	79.6	1.9	9.7	1.8	7,911	14,240	......	Do.
			2	......	40.1	57.7	2.2	.9	5.6	82.1	2.0	7.2	......	8,156	14,680	......	
			3	......	41.0	59.0	......	1.0	5.8	84.0	2.0	7.2	......	8,339	15,010	......	
Chenoa, 1 mile southeast of; Chenoa Hignite mine, Lower Hignite bed (face of 6 right entry, 2,000 feet from mine mouth).	21786	A	1	3.2	36.6	53.7	6.5	1.5	......	......	......	......	1.2	7,422	13,360	......	Bureau of Mines, 1918.
Same (face of main entry, 1,700 feet from mine mouth).	21787	A	1	8.4	35.7	51.6	4.3	1.0	......	......	......	......	6.1	7,244	13,040	2,370	Do.
Same (face of 1 left entry, 1,500 feet from mine mouth).	21788	A	1	4.6	37.0	54.1	4.3	1.0	......	......	......	......	2.3	7,561	12,610	2,500	Do.
Same (face of 5 right entry, 2,000 feet from mine mouth).	21789	A	1	4.4	36.9	54.3	4.4	1.1	......	......	......	......	2.1	7,544	13,580	2,440	Do.
Same (composite of samples 21787 to 21789, inclusive).	21790	A	1	5.7	36.8	53.2	4.3	1.0	5.8	74.9	1.7	12.3	3.5	7,444	13,400	2,650	Do.
			2	......	39.0	56.4	4.6	1.1	5.5	79.5	1.8	7.5	......	7,900	14,220	......	
			3	......	40.9	59.1	......	1.1	5.7	83.3	1.8	8.1	......	8,278	14,900	......	
2 miles southeast of; Log Mountain No. 1 mine, Mason bed (face of main entry, 1,900 feet from mine mouth).	21781	A	1	4.8	35.9	57.1	2.3	.7	......	......	......	......	2.7	7,739	13,930	2,390	Do.
Same (face of 5 left entry, 1,600 feet from mine mouth).	21782	A	1	4.2	36.0	57.7	2.1	.7	......	......	......	......	1.5	7,800	14,040	2,140	Do.
Same (face of 6 diagonal entry, 3,000 feet from mine mouth).	21783	A	1	4.4	36.2	56.3	3.1	1.1	......	......	......	......	2.2	7,672	13,810	2,190	Do.
Same (face of 4 right entry, 1,500 feet from mine mouth).	21784	A	1	4.5	36.0	57.3	2.2	.8	......	......	......	......	2.1	7,761	13,970	2,290	Do.
Same (composite of samples 21781 to 21784, inclusive).	21785	A	1	4.4	36.1	57.1	2.4	.8	5.8	78.1	1.9	11.0	2.1	7,744	13,940	......	Do.
			2	......	37.8	59.7	2.5	.8	5.6	81.7	2.0	7.4	......	8,094	14,570	......	
			3	......	38.7	61.3	......	.9	5.7	83.8	2.1	7.5	......	8,206	14,950	......	
Colmar, 1 mile north of; Armu mine, Mason bed (face of 5 left entry, 3,400 feet from mine mouth).	21681	A	1	2.3	38.6	54.4	4.7	1.3	......	......	......	......	.8	7,844	14,120	......	Do.
Same (face of 6 right entry, 2,200 feet from mine mouth).	21682	A	1	2.5	37.9	53.5	6.1	1.7	......	......	......	......	1.0	7,694	13,850	2,240	Do.
Same (face of 7 left entry, 2,300 feet from mine mouth).	21683	A	1	2.6	37.3	53.2	6.9	1.5	......	......	......	......	1.0	7,628	13,730	2,370	Do.
Same (face of 2 left entry, 3,600 feet from mine mouth).	21684	A	1	2.3	39.1	53.7	4.9	1.5	......	......	......	......	.6	7,856	14,140	2,390	Do.
Same (composite of samples 21681 to 21684, inclusive).	21685	A	1	2.5	38.2	53.8	5.5	1.5	5.5	77.3	2.1	8.1	.9	7,761	13,970	......	Do.
			2	......	39.2	55.1	5.7	1.6	5.4	79.3	2.1	5.9	......	7,961	14,330	......	
			3	......	41.6	58.4	......	1.6	5.7	84.0	2.3	6.4	......	8,444	15,200	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BELL COUNTY—continued.																	
Fourmile, 3 miles southwest of; East Jellico mine, Dean bed (face of 1 right entry, 3 main entry, 700 feet from mine mouth).	21796	A	1	3.7	35.4	53.7	7.2	.9	......	......	......	......	1.8	7,344	13,220	3,010	Bureau of Mines, 1918.
Same (face of 1 left entry, 3 main entry, 1,000 feet from mine mouth).	21797	A	1	3.9	33.8	54.2	8.1	1.1	......	......	......	......	2.0	7,222	13,000	2,910	Do.
Same (face of 1 right entry, 2 main entry, 750 feet from mine mouth).	21798	A	1	4.2	35.2	53.3	7.3	.7	......	......	......	......	2.3	7,294	13,130	......	Do.
Same (composite of samples 21796 to 21798, inclusive).	21799	A	1	3.9	34.6	54.0	7.5	.9	5.5	73.9	1.7	10.5	2.0	7,289	13,120	......	Do.
			2	......	36.1	56.1	7.8	.9	5.2	76.9	1.8	7.4	......	7,589	13,660	......	
			3	......	39.1	60.9	......	1.0	5.7	83.4	2.0	7.9	......	8,228	14,810	......	
2 miles southwest of; Magnet mine, Dean bed (face of 4 left entry, 2,100 feet from mine mouth).	21791	A	1	3.4	36.4	54.4	5.8	.9	......	......	......	......	1.9	7,478	13,460	......	Do.
Same (face of 6 room, 3 right entry, 1,700 feet from mine mouth).	21792	A	1	3.6	36.3	53.1	7.0	.8	......	......	......	......	1.7	7,389	13,300	2,910	Do.
Same (face of 5 left entry, 2,200 feet from mine mouth).	21793	A	1	4.9	35.8	52.9	6.4	1.3	......	......	......	......	3.3	7,322	13,180	2,440	Do.
Same (face of main entry, 2,200 feet from mine mouth).	21794	A	1	4.5	35.6	54.0	5.9	1.0	......	......	......	......	2.8	7,422	13,360	2,600	Do.
Same (composite of samples 21791 to 21794, inclusive).	21795	A	1	4.3	36.0	53.4	6.3	1.0	5.5	74.3	1.8	11.1	2.4	7,400	13,320	......	Do.
			2	......	37.6	55.8	6.6	1.0	5.3	77.6	1.9	7.6	......	7,728	13,910	......	
			3	......	40.2	59.8	......	1.1	5.7	83.1	2.0	8.1	......	8,272	14,890	......	
Fox Ridge; Fox Ridge mine, Straight Creek bed (face of 12 left entry, 4,600 feet from mine mouth).	21552	A	1	4.0	37.8	56.5	1.7	.9	......	......	......	......	2.3	7,950	14,310	2,030	Do.
Same (face of 12 right entry, 4,500 feet from mine mouth).	21553	A	1	3.6	38.9	54.9	2.6	1.4	......	......	......	......	1.9	7,922	14,260	1,970	Do.
Same (face of 10 right entry, 4,500 feet from mine mouth).	21554	A	1	3.1	38.1	57.5	1.2	.8	......	......	......	......	1.3	8,083	14,550	2,070	Do.
Same (face of main air course, 4,600 feet from mine mouth).	21555	A	1	4.5	36.3	57.0	2.2	1.1	......	......	......	......	2.6	7,856	14,140	2,000	Do.
Same (composite of samples 21552 to 21555, inclusive).	21556	A	1	3.8	37.7	56.6	1.9	1.0	5.8	79.6	1.9	9.8	2.0	7,961	14,330	......	Do.
			2	......	39.2	58.8	2.0	1.1	5.5	82.7	2.0	6.7	......	8,278	14,900	......	
			3	......	40.0	60.0	......	1.1	5.6	84.4	2.0	6.9	......	8,445	15,200	......	

Gravity; Winona mine, Bennets Fork)...	2887	D	4	1.3	39.0	55.0	4.7	1.2	......	......	......	......	......	*7,694	13,850	....	Kentucky Geological Survey, 1910.
			2	......	39.5	55.7	4.8	1.2	......	......	......	......	......	7,794	14,030	....	
Same..................................	2888	D	4	1.3	37.9	56.3	4.5	1.3	......	......	......	......	......	*7,628	13,730	....	Do.
			2	......	38.4	57.0	4.6	1.3	......	......	......	......	......	7,728	13,910	....	
Harrison; Log Mountain No. 52 mine, Poplar Lick bed (face of 7 left entry, 3,200 feet from mine mouth).	21617	A	1	3.3	37.0	53.7	6.0	1.1	......	......	......	......	1.0	7,544	13,580	2,620	Bureau of Mines, 1918.
Same (face of 7 right entry, 3,400 feet from mine mouth).	21618	A	1	3.4	37.8	54.4	4.4	2.0	......	......	......	......	1.1	7,678	13,820	2,640	Do.
Same (face of 2 face heading, 3,000 feet from mine mouth).	21619	A	1	3.6	36.8	54.4	5.2	1.0	......	......	......	......	1.2	7,578	13,640	2,960	Do.
Same (face of 5 left entry, 3,200 feet from mine mouth).	21620	A	1	3.5	37.7	53.9	4.9	1.1	......	......	......	......	1.3	7,622	13,720	2,440	Do.
Same (composite of samples 21617 to 21620, inclusive).	21621	A	1	3.4	37.5	54.0	5.1	1.0	5.6	76.5	2.0	9.8	1.2	7,617	13,710	....	Do.
			2	......	38.8	55.9	5.3	1.1	5.4	79.2	2.1	6.9	......	7,883	14,190	....	
			3	......	41.0	59.0	......	1.1	5.7	83.6	2.2	7.4	......	8,317	14,970	....	
Kettle Island; Pioneer mine, Straight Creek bed (face of 6 left entry, 2,500 feet from mine mouth).	21547	A	1	4.5	37.1	53.6	4.8	1.2	......	......	......	......	2.8	7,589	13,660	2,120	Do.
Same (face of 6 right entry, 2,700 feet from mine mouth).	21548	A	1	4.6	37.5	52.9	5.0	1.5	......	......	......	......	3.0	7,617	13,710	2,170	Do.
Same (face of 4 left entry, 1,900 feet from mine mouth).	21549	A	1	3.8	36.0	54.6	5.7	1.3	......	......	......	......	2.2	7,600	13,680	2,380	Do.
Same (face of 1 left entry, 2,000 feet from mine mouth).	21550	A	1	3.9	37.1	55.9	3.1	1.3	......	......	......	......	2.3	7,867	14,160	1,980	Do.
Same (composite of samples 21547 to 21550, inclusive).	21551	A	1	4.2	37.2	53.9	4.7	1.4	5.6	76.8	1.9	9.6	2.6	7,661	13,790	....	Do.
			2	......	38.8	56.3	4.9	1.4	5.4	80.1	2.0	6.2	......	7,994	14,390	....	
			3	......	40.8	59.2	......	1.5	5.7	84.2	2.1	6.6	......	8,406	15,130	....	
Logmont; Crystal mine, Poplar Lick bed (rib at face, 1 right main entry, 1,800 feet north 20° west of mine mouth).	82067	A	1	2.7	37.9	50.9	8.5	2.8	......	......	......	......	1.7	7,356	13,240	2,510	Do.
Same (rib near face, straight main entry, 1,450 feet south 60° west of mine mouth).	82068	A	1	2.9	36.6	48.0	12.5	2.6	......	......	......	......	1.8	6,967	12,540	2,680	Do.
Same (rib at face, 2 right entry, straight main entry, 1,300 feet west of mine mouth).	82069	A	1	2.8	37.0	49.0	11.2	2.6	......	......	......	......	1.8	7,111	12,800	2,620	Do.
Same (face of last crosscut, 5 left entry, 1 right main entry, 1,500 feet north 60° west of mine mouth).	82070	A	1	3.0	37.4	49.3	10.3	2.3	......	......	......	......	2.1	7,106	12,790	2,740	Do.
Same (composite of samples 82067 to to 82070, inclusive).	82071	A	1	2.8	36.7	49.9	10.6	2.6	5.3	70.8	1.6	9.1	1.8	7,144	12,860	....	Do.
			2	......	37.7	51.4	10.9	2.7	5.1	72.8	1.7	6.8	......	7,350	13,230	....	
			3	......	42.4	57.6	......	3.0	5.8	81.8	1.9	7.5	......	8,256	14,860	....	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BELL COUNTY—continued.																	
Pineville; Arcadia No. 4 mine, Straight Creek Bed (face of main entry, 2,200 feet north of mine mouth).	81274	A	1	2.4	36.2	56.0	5.4	.7	......	......	......	......	.7	7,683	13,830	2,390	Bureau of Mines, 1918
Same (rib at face of 9 right heading, 2,000 feet northwest of mine mouth).	81275	A	1	3.1	36.2	54.9	5.8	.7	......	......	......	......	1.4	7,594	13,670	2,390	Do.
Same (pillar 6 room, 6 right entry, 1,000 feet northwest of mine mouth).	81276	A	1	2.8	35.7	55.5	6.0	.6	......	......	......	......	1.0	7,628	13,730	2,280	Do.
Same (face of 4 right entry, 1,000 feet northwest of mine mouth).	81277	A	1	2.8	37.4	57.5	2.3	.5	......	......	......	......	1.1	7,856	14,140	2,240	Do.
Same (composite of samples 81274 to 81277, inclusive).	82178	A	1	2.6	36.6	56.1	4.7	.7	5.5	77.5	1.9	9.7	1.1	7,705	13,870	......	Do.
			2	......	37.6	57.6	4.8	.7	5.3	79.5	2.0	7.7	......	7,911	14,240	......	
			3	......	39.5	60.5	......	.8	5.6	83.5	2.1	8.0	......	8,306	14,950	......	
New Straight Creek mine, Straight Creek bed (face of main entry, 1,000 feet northwest of mine mouth).	81279	A	1	2.6	38.0	57.0	2.4	.7	......	......	......	......	1.0	7,966	14,340	2,240	Do.
Same (face of heading, 6 left entry, 900 feet northwest of mine mouth).	81280	A	1	2.3	40.5	54.1	3.1	1.9	......	......	......	......	.9	7,928	14,270	2,280	Do.
Same (face of 5 right entry, 1,000 feet northwest of mine mouth).	81281	A	1	2.7	37.3	57.1	2.9	.6	......	......	......	......	1.1	7,867	14,160	2,240	Do.
Same (rib of 16 room, 4 right entry, 800 feet northwest of mine mouth).	81282	A	1	3.1	37.5	57.3	2.1	1.0	......	......	......	......	1.5	7,889	14,200	2,110	Do.
Same (composite of samples 81279 to 81282, inclusive).	81283	A	1	3.1	38.2	56.2	2.5	1.2	5.8	78.9	1.9	9.7	1.5	7,894	14,210	......	Do.
			2	......	39.5	57.9	3.6	1.2	5.7	81.5	2.0	6.0	......	8,150	14,670	......	
			3	......	40.5	59.5	......	1.3	5.8	83.7	2.0	7.2	......	8,367	15,060	......	
Ralston; Atlas mine, Hignite bed (rib near face of 1 left entry, 8 left entry, 1,900 feet south 10° of mine mouth).	82403	A	1	3.2	37.0	55.9	3.9	.6	......	......	......	......	2.1	7,711	13,880	+2,740	Do.
Same (rib near face, 2 right entry, 8 left entry, 2,400 feet south 30° west of mine mouth).	82404	A	1	3.9	36.6	55.7	3.8	.6	......	......	......	......	3.0	7,650	13,770	2,740	Do.
Same (face of last crosscut, 2 left entry, 8 right entry, 2,300 feet south 60° west of mine mouth).	82405	A	1	3.6	36.9	55.6	3.9	.7	......	......	......	......	2.5	7,628	13,730	+2,740	Do.

Same (rib at face of 9 right entry, 2,500 feet south 45° west of mine mouth).	82406	A	1	3.9	34.8	55.9	5.4	.7	......	......	......	......	2.8	7,522	13,540	+2,740	Do.
Same (composite of samples 82403 to 82406, inclusive).	82407	A	1	3.7	36.4	55.7	4.2	.7	5.7	76.5	1.6	11.3	2.6	7,628	13,730	......	Do.
			2	......	37.8	59.8	4.4	.7	5.4	79.5	1.7	8.3	......	7,917	14,250	......	
			3	......	39.5	60.5	......	.7	5.7	83.1	1.8	8.7	......	8,283	14,910	......	
Pinnacle mine, Poplar Lick bed (face of 11 rooms, 12 right entry, face entry, 4,500 feet north 50° west of mine mouth).	82072	A	1	2.8	39.0	49.3	8.9	3.0	......	......	......	......	1.9	7,283	13,110	2,510	Do.
Same (rib of last crosscut, face entry, 10 left entry, 5,000 feet north 60° west of mine mouth).	82073	A	1	3.1	37.6	50.0	9.3	2.9	......	......	......	......	2.1	7,222	13,000	2,570	Do.
Same (rib near face, 11 left entry, 5,000 feet north 80° west of mine mouth).	82074	A	1	3.3	38.5	49.9	8.3	2.3	......	......	......	......	3.4	7,300	13,140	2,680	Do.
Same (rib of last crosscut, 13 left entry, 10 left entry, 4,200 feet west of mine mouth).	82075	A	1	3.1	38.5	50.4	8.0	3.2	......	......	......	......	2.1	7,350	13,230	2,280	Do.
Same (composite of samples 82072 to 82075, inclusive).	82076	A	1	3.0	37.9	50.5	8.6	2.8	5.4	72.4	1.6	9.2	2.1	7,283	13,110	......	Do.
			2	......	39.1	52.0	8.9	2.9	5.3	74.7	1.7	6.5	......	7,511	13,520	......	
			3	......	42.9	57.1	3.2	3.2	5.8	82.0	1.8	7.2	......	8,244	14,840	......	
Rim; Rim No. 4 mine, Hickory bed (face of 6 right entry, 3,200 feet from mine mouth).	21622	A	1	3.2	35.3	52.1	9.4	1.2	......	......	......	......	1.3	7,272	13,090	2,020	Do.
Same (face of 6 left entry, 3,100 feet from mine mouth).	21623	A	1	3.5	37.3	55.6	3.6	1.0	......	......	......	......	1.4	7,778	14,000	2,410	Do.
Same (face of 1 main entry, 3,200 feet from mine mouth).	21624	A	1	3.6	36.8	56.2	3.4	.8	......	......	......	......	1.4	7,789	14,020	2,450	Do.
Same (face of 4 left entry, 2,400 feet from mine mouth).	21625	A	1	3.5	37.7	54.4	4.4	1.0	......	......	......	......	1.5	7,722	13,900	2,480	Do.
Same (composite of samples 21622 to 21625, inclusive).	21626	A	1	3.4	37.0	54.4	5.2	1.0	5.6	76.9	1.8	9.5	1.4	7,661	13,790	......	Do.
			2	......	38.3	56.3	5.4	1.1	5.4	79.6	1.8	6.7	......	7,933	14,280	......	
			3	......	40.5	59.5	......	1.1	5.7	84.1	1.9	7.2	......	8,383	15,090	......	
Shamrock; Shamrock mine, Sandstone Parting bed (face of north main entry, 4,200 feet south 80° west of mine mouth).	82413	A	1	2.8	35.2	54.9	7.1	1.0	......	......	......	......	1.7	7,456	13,420	+2,740	Do.
Same (on right rib at face of 2 room, 7 north main entry, 4,100 feet south 60° west of mine mouth).	82414	A	1	3.5	35.3	54.2	7.0	1.0	......	......	......	......	2.3	7,417	13,350	+2,740	Do.
Same (pillar 1 room, 6 left entry, new main entry, 1,300 feet south 45° west of mine mouth).	82415	A	1	2.7	35.8	54.3	7.2	.9	......	......	......	......	1.4	7,444	13,400	+2,740	Do.
Same (rib of old main entry, 2,400 feet south 30° east of mine mouth).	82416	A	1	2.8	36.0	55.9	5.3	.9	......	......	......	......	1.5	7,589	13,660	+2,740	Do.
Same (composite of samples 82413 to 82416, inclusive).	82417	A	1	3.1	35.1	54.9	6.9	1.0	5.4	75.0	1.9	9.8	1.8	7,478	13,460	......	Do.
			2	......	36.3	56.6	7.1	1.0	5.2	77.4	2.0	7.3	......	7,717	13,890	......	
			3	......	39.0	61.0	......	1.1	5.6	83.4	2.1	7.8	......	8,311	14,960	......	

TABLE 1.—*Chemical analyses mine samples*—Consinued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BELL COUNTY—continued.																	
Shamrock: Shamrock mine—Continued. Edgewood No. 2 mine, Sterling bed (face of main entry, 2,000 feet southeast of mine mouth).	82408	A	1	2.4	37.8	50.4	9.4	3.2	......	......	......	......	1.6	7,244	13,040	2,280	Bureau of Mines, 1918.
Same (rib of last cross cut, 6 right entry, main entry, 1,800 feet south 20° east of mine mouth).	82409	A	1	2.2	37.0	51.0	9.8	3.1	......	......	......	......	1.5	7,300	13,140	2,240	Do.
Same (rib at face, 5 right entry, main entry, 1,600 feet south of mine mouth).	82410	A	1	2.3	36.6	51.3	9.8	2.7	......	......	......	......	1.6	7,261	13,070	2,620	Do.
Same (pillar of 10 room, 3 right entry, 1,700 feet south 15° west of mine mouth).	82411	A	1	2.1	37.6	51.3	9.0	3.2	......	......	......	......	1.1	7,361	13,250	2,570	Do.
Same (composite of samples 82408 to 82411, inclusive).	82412	A	1	2.3	36.7	51.6	9.4	3.1	5.3	72.5	1.6	8.1	1.4	7,306	13,150	......	Do.
			2	......	37.5	52.8	9.7	3.2	5.1	74.2	1.6	6.2	......	7,472	13,450	......	
			3	......	41.5	58.5	......	3.5	5.7	82.1	1.8	6.9	......	8,273	14,890	......	
Straight Creek; Barker Nos. 2 and 3 mines, Straight Creek bed (face of 4 right entry, 1½ miles from mine mouth).	21567	A	1	2.9	38.3	55.3	3.5	1.2	......	......	......	......	1.4	7,833	14,100	2,170	Do.
Same (face of 5 north entry, 1¼ miles from mine mouth).	21568	A	1	3.3	37.6	56.8	2.3	1.2	......	......	......	......	1.6	7,900	14,220	2,130	Do.
Same (face of 3 right entry, 7 north entry, 1½ miles from mine mouth).	21569	A	1	3.2	37.2	56.0	3.6	1.1	......	......	......	......	1.4	7,783	14,010	2,130	Do.
Same (face of 4 right entry, 3 main entry, 1½ miles from mine mouth).	21570	A	1	4.1	36.5	54.6	4.8	1.7	......	......	......	......	2.3	7,633	13,740	......	Do.
Same (face of 2 main entry, 1¼ miles from mine mouth).	21571	A	1	2.7	38.2	54.3	4.8	1.7	......	......	......	......	1.1	7,706	13,870	2,160	Do.
Same (composite of samples 21567 to 21571, inclusive).	21572	A	1	3.3	37.5	55.4	3.8	1.3	5.6	78.1	2.0	9.2	1.6	7,789	14,020	2,090	Do.
			2	......	38.8	57.3	3.9	1.4	5.4	80.7	2.0	6.6	......	8,056	14,500	......	
			3	......	40.4	59.6	......	1.4	5.6	84.0	2.1	6.9	......	8,383	15,090	......	
Straight Creek No. 2 Mine, Straight Creek bed (main entry, 37-inch cut).	1321	B	1	2.9	36.0	57.6	3.5	.9	......	......	......	......	1.0	7,956	14,320	......	U. S. Geological Survey, 1906.
			2	......	37.1	59.3	3.6	.9	......	......	......	......	......	8,194	14,750	......	
Same (76 room, main entry, 38½-inch cut).	1322	B	1	2.8	37.1	57.3	2.8	.8	......	......	......	......	.9	......	......	......	Do.
			2	......	38.2	58.9	2.9	.9	......	......	......	......	......	......	......	......	
Same (99 room, main entry, 3,000 feet northeast of mine mouth).	2350	B	1	3.4	35.9	57.5	3.2	1.5	......	......	......	......	1.5	7,989	14,380	......	Do.
			2	......	37.2	59.5	3.3	1.6	......	......	......	......	......	8,267	14,880	......	

Same (48 room, 4 north butt entry, 3,600 feet from mine mouth).	2351	B	1	3.3	36.1	57.7	2.9	.9	......	......	......	......	1.2	......	......	......	Do.
			2	......	37.3	59.7	3.0	.9	......	......	......	......	......	......	......	......	
Same (composite of three samples from the bed).	2748	D	4	2.3	37.7	56.8	3.2	.9	......	......	......	......	......	*8,133	14,640	......	Kentucky Geological Survey, 1910.
			2	......	38.6	58.2	3.2	.9	......	......	......	......	......	8,328	14,990	......	
Tejay; Tejay mine, Mason or Creech bed (face of 6 right entry, 2,600 feet from mine mouth).	21562	A	1	3.2	37.4	56.7	2.7	.9	......	......	......	......	1.9	7,883	14,190	2,390	Bureau of Mines, 1918.
Same (face of 4 left entry, 3,600 feet from mine mouth).	21563	A	1	2.8	37.8	56.3	3.1	1.0	......	......	......	......	1.1	7,911	14,240	2,430	Do.
Same (face of 4 right entry, 2,000 feet from mine mouth).	21564	A	1	2.7	39.0	55.7	2.6	1.0	......	......	......	......	1.1	7,956	14,320	2,410	Do.
Same (face of 7 left entry, 2,800 feet from mine mouth).	21565	A	1	2.7	38.5	54.9	3.9	1.0	......	......	......	......	1.0	7,856	14,140	2,320	Do.
Same (composite of samples 21562 to 21565, inclusive).	21566	A	1	2.9	38.0	56.0	3.1	1.0	5.6	79.4	1.9	9.0	1.3	7,900	14,220	......	Do.
			2	......	39.1	57.7	3.2	1.0	5.5	81.8	1.9	6.6	......	8,139	14,650	......	
			3	......	40.4	59.6	......	1.0	5.7	84.5	2.0	6.8	......	8,406	15,130	......	
Varilla; Varilla mine, Upper Hance bed (face of 2 main entry, 400 feet from mine mouth).	21776	A	1	2.5	37.6	56.4	3.5	1.1	......	......	......	......	1.1	7,917	14,250	2,370	Do.
Same (face of 10 left entry, 3,700 feet from mine mouth).	21777	A	1	2.3	38.1	55.1	4.5	1.6	......	......	......	......	.9	7,839	14,110	2,270	Do.
Same (face of 7 right entry, 3,200 feet from mine mouth).	21778	A	1	2.0	39.1	52.4	6.5	2.7	......	......	......	......	.8	7,695	13,580	2,130	Do.
Same (face of 5 right entry, 3,700 feet from mine mouth).	21779	A	1	2.3	37.4	56.4	3.9	1.0	......	......	......	......	.9	7,078	14,180	2,550	Do.
Same (composite of samples 21776 to 21779, inclusive).	21780	A	1	2.3	37.8	55.3	4.6	1.6	5.7	78.2	2.0	7.9	.9	7,839	14,110	......	Do.
			2	......	38.7	56.6	4.7	1.6	5.6	80.1	2.0	6.0	......	8,028	14,450	......	
			3	......	40.6	59.4	......	1.7	5.9	84.0	2.1	6.3	......	8,428	15,170	......	
NOTE.—Coals below are in the coal field adjacent to Pineville Gap. Samples are nearly all from outcrops in the banks of streams.																	
Big Clear Creek, Bear Branch of, Lower Hignite bed.	3063	D	4	1.6	33.4	61.5	3.5	.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1905.
				......	33.9	62.6	3.5	.8	......	......	......	......	......	......	......	......	
Same, Upper Hignite bed	3060	D	4	2.0	32.8	59.5	5.7	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	33.5	60.7	5.8	1.0	......	......	......	......	......	......	......	......	
Same, Poplar Lick bed	3064	D	4	1.8	33.0	60.1	5.1	.7	......	......	......	......	......	......	......	......	Do.
			2	......	33.6	61.2	5.2	.7	......	......	......	......	......	......	......	......	
Sugar Camp Branch of, Lower Hignite bed.	3058	D	4	2.7	34.1	59.7	3.5	.8	......	......	......	......	......	......	......	......	Do.
			2	......	35.1	61.3	3.6	.9	......	......	......	......	......	......	......	......	
Caney Branch of, at head, Upper Hignite bed.	3071	D	4	2.5	32.2	57.5	7.8	.6	......	......	......	......	......	......	......	......	Do.
			2	......	33.0	59.0	8.0	.6	......	......	......	......	......	......	......	......	
Same, Lower Hignite bed	3074	D	4	2.4	33.9	60.5	3.2	.6	......	......	......	......	......	......	......	......	Do.
			2	......	34.7	62.0	3.3	.7	......	......	......	......	......	......	......	......	
Mud Branch of (cannel coal)	......	D	4	1.1	51.6	40.3	7.0	.7	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	52.2	40.7	7.0	.8	......	......	......	......	......	......	......	......	
Little Clear Creek, Polk Branch of (1,020 feet above mouth) Red Spring coal.	3069	D	4	3.4	32.4	59.2	5.0	.6	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1905.
			2	......	33.5	61.3	5.2	.6	......	......	......	......	......	......	......	......	

TABLE 1.—*Chemical analysis of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BELL COUNTY—continued.																	
Straight Creek, forks of, Straight Creek bed (average sample from 3-room entry).	3080	D	4	2.0	33.9	61.1	3.0	.6	.....	.....	.....	.....	.....	.....	.....	.....	Kentucky Geological Survey, 1905.
			2	.....	34.6	62.3	3.1	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Caney Fork of, left fork of, near B. A. Rice's house, Straight Creek bed.	3055	D	4	2.2	33.8	62.7	1.3	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	34.6	64.1	1.3	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Yellow Creek, right fork of Slick Rock Branch of Stony Fork of, Poplar Lick bed.	3091	D	4	2.0	33.5	55.3	9.2	2.3	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	34.2	56.4	9.4	2.3	.....	.....	.....	.....	.....	.....	.....	.....	
Beans Fork of, Poplar Lick bed.......	3087	D	4	2.1	32.9	59.9	5.1	.9	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	33.6	61.2	5.2	.9	.....	.....	.....	.....	.....	.....	.....	.....	
Stony Fork of, 8 to 10 miles above Middlesboro, Lower Hignite bed.	3078	D	4	3.0	32.0	62.0	3.0	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	33.0	63.9	3.1	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Hignite Fork of Stony Fork of, Poplar Lick bed.	3067	D	4	2.6	33.4	59.2	4.8	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	34.3	60.8	4.9	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Same, Red Spring coal................	3059	D	4	2.2	34.2	60.4	3.2	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	35.0	61.7	3.3	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Stony Creek, Fork Ridge, Colonel Eve's land (cannel coal).	1668	D	4	1.0	43.6	47.8	7.6	.6	.....	.....	.....	.....	.....	.....	.....	.....	Kentucky Geological Survey, 1890.
			2	.....	44.0	48.3	7.7	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Wallsend No. 1 mine, Straight Creek (Pineville) bed.	2791	D	4	1.2	36.8	60.0	2.0	.7	.....	.....	.....	.....	.....	*7,961	14,330	.....	Kentucky Geological Survey, 1910.
			2	.....	37.2	60.7	2.1	.7	.....	.....	.....	.....	.....	8,056	14,500	.....	
Wallsend No. 3 mine (composite of two samples).	2972	D	4	1.1	35.4	61.3	2.1	.7	.....	.....	.....	.....	.....	*7,872	14,170	.....	Do.
			2	.....	36.0	61.9	2.1	.7	.....	.....	.....	.....	.....	7,967	14,340	.....	
BOYD COUNTY.																	
Buena Vista Furnace; ¼ mile from Furnace Branch of Straight Creek, No. 5 bed.	1279	D	4	6.5	33.9	52.8	6.8	3.8	.....	.....	.....	.....	.....	.....	.....	.....	Kentucky Geological Survey, 1890.
			2	.....	36.3	56.4	7.3	4.0	.....	.....	.....	.....	.....	.....	.....	.....	
One-third mile from, drift on south side of Straight Creek, No. 5 bed.	1282	D	4	3.2	32.3	53.0	11.5	2.0	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	33.4	54.7	11.9	2.1	.....	.....	.....	.....	.....	.....	.....	.....	
Keyes Creek coal, No. 6 bed..........	1283	D	4	2.9	32.6	56.7	7.7	1.2	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	33.6	58.4	8.0	2.0	.....	.....	.....	.....	.....	.....	.....	.....	
Bellefont Furnace; ⅓ mile southeast of; drift on Hood's Creek, No. 3 bed.	1284	D	4	3.2	29.7	55.1	12.0	1.8	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	30.7	56.9	12.4	1.9	.....	.....	.....	.....	.....	.....	.....	.....	
Catlettsburg; Horse Branch (splint coal), No. 6 bed.	1285	D	4	2.7	36.7	52.6	8.0	1.7	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	.....	37.7	54.1	8.2	1.8	.....	.....	.....	.....	.....	.....	.....	.....	

Coalton; Ashland No. 4 mine (splint coal), No. 7 bed.	1286	D	4	3.3	33.3	57.6	5.8	2.5	......	......	......	......	......	......	......	......	Do.
			2	......	34.4	59.6	6.0	2.6	......	......	......	......	......	......	......	......	
Dry Branch, entry No. 4, cross entry, No. 7 bed.	1287	D	4	4.4	31.1	57.9	6.6	2.1	......	......	......	......	......	......	......	......	Do.
			2	......	32.5	60.6	6.9	2.2	......	......	......	......	......	......	......	......	
Trace Creek, 300 yards from end of No. 4 entry, No. 7 bed.	1288	D	4	4.1	34.2	54.7	7.0	1.9	......	......	......	......	......	......	......	......	Do.
			2	......	35.7	57.0	7.3	1.9	......	......	......	......	......	......	......	......	
Same, 250 yards from west end of No. 4 entry.	1289	D	4	5.0	34.5	55.4	5.1	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	36.3	58.3	5.4	1.4	......	......	......	......	......	......	......	......	
Fourmile Creek, Bryan's Bank, No. 7 bed..	1290	D	4	4.0	34.1	53.2	8.7	1.9	......	......	......	......	......	......	......	......	Do.
			2	......	35.5	55.4	9.1	2.0	......	......	......	......	......	......	......	......	
Little Sandy River, Bolt's Fork of East Fork of, No. 11 bed.	1291	D	4	2.6	35.8	46.9	14.7	5.4	......	......	......	......	......	......	......	......	Do.
			2	......	36.8	48.1	15.1	5.5	......	......	......	......	......	......	......	......	
Princess; Princess mine, No. 7 (Coalton) bed.	3026	D	4	3.3	34.8	53.2	8.7	2.1	......	......	......	......	......	*6,794	12,230	......	Kentucky Geological Survey, 1910.
			2	......	36.0	55.0	9.0	2.2	......	......	......	......	......	7,028	12,650	......	
BREATHITT COUNTY.																	
NOTE.—These are some analyses of samples taken along the North Fork of the Kentucky River and its branches, also along Quicksand Creek.																	
North Fork of the Kentucky River, Joe Little Bank (cannel coal).	3110	D	4	.1	62.4	31.5	6.0	1.0	......	......	......	......	......	......	......	......	Kentucky Geologica Survey, 1905.
			2	......	62.5	31.5	6.0	1.0	......	......	......	......	......	......	......	......	
William Spencer's mine............	1714	D	4	3.6	33.6	58.3	4.5	1.4	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	34.8	60.5	4.7	1.4	......	......	......	......	......	......	......	......	
Frozen Creek, ½ mile above William Day's land (splint coal).	1708	D	4	2.5	41.1	49.2	7.2	.8	......	......	......	......	......	......	......	......	Do.
			2	......	42.2	50.4	7.4	.8	......	......	......	......	......	......	......	......	
Nichol's Fork of, Johnson's cannel coal outcrop).	1707	D	4	1.2	58.8	35.3	4.7	......	......	......	......	......	......	......	......	......	Do.
			2	......	59.5	35.7	4.8	......	......	......	......	......	......	......	......	......	
George Creek (cannel coal)............	1711	D	4	1.0	52.4	35.5	11.1	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	52.9	35.8	11.3	1.4	......	......	......	......	......	......	......	......	
Leatherwood Branch of North Fork, Hazard bed (muddy opening).	2614	D	4	9.6	29.5	44.1	16.8	.5	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	32.6	48.8	18.6	.5	......	......	......	......	......	......	......	......	
Same, Flag bed....................	2615	D	4	2.8	31.2	53.3	12.7	.7	......	......	......	......	......	......	......	......	Do.
			2	......	32.1	54.8	13.1	.7	......	......	......	......	......	......	......	......	
Lost Creek, Mill Branch of, Fire Clay bed ..	2528	D	4	1.4	35.9	52.5	10.2	3.5	......	......	......	......	......	......	......	......	Do.
			2	......	36.4	53.3	10.3	3.5	......	......	......	......	......	......	......	......	
Quicksand Creek, Alfred Little's drift (cannel coal).	1709	D	4	2.1	43.1	43.4	11.4	4.6	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	44.0	44.3	11.7	4.7	......	......	......	......	......	......	......	......	
John Brown Branch of Spring Fork of, Hazard bed (outcrop).	3523	D	4	1.7	39.6	49.9	8.8	2.5	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	40.3	50.8	8.9	2.5	......	......	......	......	......	......	......	......	
Calhoun Branch, R. L. Back land, upper bench of Dean bed.	3512	D	4	2.2	37.6	53.3	6.9	.6	......	......	......	......	......	......	......	......	Do.
			2	......	38.5	54.5	7.0	.6	......	......	......	......	......	......	......	......	
Cloverfield Branch of Spring Fork, Moss Noble land, Wilson Fork bed.	3522	D	4	1.8	37.6	52.2	8.4	.7	......	......	......	......	......	......	......	......	Do.
			2	......	38.3	55.1	8.6	.7	......	......	......	......	......	......	......	......	
Laurel Branch of Hawes Fork of Spring Fork, lower bench of Dean bed.	3516	D	4	2.0	39.3	54.9	3.8	.6	......	......	......	......	......	......	......	......	
			2	......	40.1	56.0	3.9	.6	......	......	......	......	......	......	......	......	
Near gauge, on left of creek, Floyd Craft entry, Haddix bed.	3515	D	4	1.8	38.2	50.3	9.7	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	38.9	51.2	9.9	1.3	......	......	......	......	......	......	......	......	
Meatscaffold Branch, Pearl Back land, Whitesburg bed.	3511	D	4	2.0	39.1	52.4	6.5	.9	......	......	......	......	......	......	......	......	Do.
			2	......	39.9	53.5	6.6	.9	......	......	......	......	......	......	......	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
BREATHITT COUNTY—continued.																	
Quicksand Creek, Poplar Fork of Hawes Fork of Spring Fork, upper bench, Haddix bed.	3519	D	4	.7	35.7	53.1	10.5	1.5	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	36.0	53.4	10.6	1.5	......	......	......	......	......	......	......	......	
Same, Middle bench, Haddix bed.....	3520	D	4	1.5	37.0	52.2	9.3	.6	......	......	......	......	......	......	......	......	Do.
			2	......	37.6	53.0	9.4	.7	......	......	......	......	......	......	......	......	
Rube Patrick Fork of Little Caney Creek, Sam Patton land, Whitesburg bed.	3513	D	4	1.4	35.2	54.0	9.4	.7	......	......	......	......	......	......	......	......	Do.
			2	......	35.7	54.8	9.5	.7	......	......	......	......	......	......	......	......	
Same, Dean bed (splint coal).........	3514	D	4	1.8	33.4	45.6	19.2	1.1	......	......	......	......	......	......	......	......	Do.
			2	......	34.0	46.5	19.5	1.1	......	......	......	......	......	......	......	......	
South Quicksand Creek, Press Howard Camps, Haddix bed.	3510	D	4	1.7	39.6	48.0	10.7	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	40.3	48.9	10.8	1.4	......	......	......	......	......	......	......	......	
Troublesome Creek, Roberts' bank, upper (bituminous) part.	1702	D	4	3.3	31.4	49.8	12.5	1.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	32.5	51.6	12.9	1.0	......	......	......	......	......	......	......	......	
Same, lower (cannel) part............	1703	D	4	3.4	43.4	47.0	6.2	.6	......	......	......	......	......	......	......	......	Do.
			2	......	44.9	48.6	6.5	.7	......	......	......	......	......	......	......	......	
Same, middle part of bed (called bituminous).	1704	D	4	2.2	39.2	51.1	7.5	2.5	......	......	......	......	......	......	......	......	Do.
			2	......	40.1	52.3	7.6	2.6	......	......	......	......	......	......	......	......	
Haddix bed (cannel coal, somewhat weathered).	1705	D	4	1.3	47.0	44.4	7.3	1.6	......	......	......	......	......	......	......	......	Do.
			2	......	47.6	45.0	7.4	1.6	......	......	......	......	......	......	......	......	
Troublesome Creek, near mouth of, Jackson Well's Bank (dirty outcrop).	1710	D	4	2.8	35.5	44.9	16.8	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	36.5	46.3	17.2	1.5	......	......	......	......	......	......	......	......	Do.
Noble Branch of, Sewell and Little mine, Haddix bed (cannel coal).	3111r	D	4	.7	50.9	36.7	11.7	3.9	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1905.
			2	......	51.3	36.9	11.8	3.9	......	......	......	......	......	......	......	......	
Same..................................	2282r	D	4	1.6	46.6	46.8	5.0	.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	47.4	47.5	5.1	.8	......	......	......	......	......	......	......	......	
CARTER COUNTY.																	
Barrett's Creek, ½ mile from N. Lewis' house (probably No. 2 bed).	1358	D	4	4.2	33.7	51.4	10.7	3.5	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	35.2	53.6	11.2	3.6	......	......	......	......	......	......	......	......	
Graham bank, No. 1 bed.............	1646	D	4	3.5	36.3	57.3	2.9	1.2	......	......	......	......	......	......	......	......	Do.
			2	......	37.6	59.4	3.0	1.2	......	......	......	......	......	......	......	......	
Grayson, 2 miles east of; Carter farm, Dr. Jones' land (probably No. 3 bed).	1359	D	4	3.0	36.2	49.2	11.6	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	37.3	50.8	11.9	1.4	......	......	......	......	......	......	......	......	
Same, Everman's Creek; Kibby drift, No. 2 bed.	1356	D	4	4.1	34.6	56.5	4.8	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	36.1	58.9	5.0	1.8	......	......	......	......	......	......	......	......	

Straight Creek, Gum Branch of, Mount Savage drift (Coalton), No. 7 bed.	1350	D	4	6.5	31.4	57.6	4.5	1.7	......	......	......	......	......	......	......	Do.
			2	......	33.6	61.5	4.9	1.8	......	......	......	......	......	......	......	
Mount Savage Furnace; Pritchard's bank (Coalton), No. 7 bed.	1348	D	4	5.4	32.7	52.5	9.4	2.4	......	......	......	......	......	......	......	Do.
			2	......	34.6	55.5	9.9	2.5	......	......	......	......	......	......	......	
Middle layer from entry back of Star Furnace, No. 7 bed.	1347	D	4	6.4	27.2	58.9	7.5	1.0	......	......	......	......	......	......	......	Do.
Bottom layer from entry back of Star Furnace, No. 7 bed.	1346	D	4	6.6	34.4	54.6	4.4	.7	......	......	......	......	......	......	......	Do.
Upper layer from entry back of Star Furnace, No. 7 bed.	1345	D	4	7.7	28.2	53.0	11:1	1.1	......	......	......	......	......	......	......	Do.
Tygert Creek, Stone coal branch of, No. 1 bed.	1357	D	4	4.6	33.5	51.6	10.3	1.2	......	......	......	......	......	......	......	Do.
			2	......	35.1	54.1	10.8	1.3	......	......	......	......	......	......	......	
Williard; from main entry, west of Dry Fork, No. 7 bed.	1354	D	4	3.2	35.1	54.4	7.3	2.6	......	......	......	......	......	......	......	Do.
			2	......	36.2	56.2	7.6	2.7	......	......	......	......	......	......	......	
Little Fork of Little Sandy River, Graham bank, No. 1 bed.	1353	D	4	3.8	34.5	58.5	3.2	2.2	......	......	......	......	......	......	......	Do.
			2	......	35.9	60.8	3.3	2.3	......	......	......	......	......	......	......	
Old Lost Creek, No. 7 bed............	1355	D	4	3.7	36.0	52.9	7.4	2.7	......	......	......	......	......	......	......	Do.
			2	......	37.3	55.0	7.7	2.8	......	......	......	......	......	......	......	
Watson bank (Coalton), No. 7 bed....	1352	D	4	4.4	34.5	52.0	9.1	2.2	......	......	......	......	......	......	......	Do.
			2	......	36.1	55.3	9.6	2.3	......	......	......	......	......	......	......	
CLAY COUNTY.																
NOTE.—Coals from the South Fork and its tributaries; outcrop samples.																
Blue-Hole Branch of Red Bird Creek, near the mouth of Bear Wallow, 1½ miles up branch.	3127	D	4	1.2	29.8	65.0	4.0	.8	......	......	......	......	......	......	......	Kentucky Geological Survey, 1905.
			2	......	30.2	65.7	4.1	.8	......	......	......	......	......	......	......	
Hall's Fork, on the right of, 4 miles up Big Creek, Hazard bed.	2740	D	4	1.6	34.9	65.5	8.0	1.1	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	35.5	56.4	8.1	1.1	......	......	......	......	......	......	......	
Manchester; 2½ miles south of; on Horse Creek. Garrard mine, Manchester bed.	2648	D	4	1.2	38.1	54.9	5.8	1.8	......	......	......	......	......	......	......	Do.
			2	......	38.6	55.5	5.9	1.8	......	......	......	......	......	......	......	
Little Beech Creek of Goose Creek, Jeff. Jones Mine, Manchester bed.	3582	D	1	.9	40.4	45.3	13.4	3.2	......	......	......	......	......	......	......	Kentucky Geological Survey, 1918.
			2	......	40.8	45.7	13.5	3.3	......	......	......	......	......	......	......	
Granny Branch, 7¾ miles from Manchester, Howard bed (face of entry).	3583	D	1	1.6	39.3	55.2	3.9	1.3	......	......	......	......	......	......	......	Do.
			2	......	39.9	56.1	4.0	1.4	......	......	......	......	......	......	......	
Lockart Creek, up Goose Creek, 4½ miles from Manchester, Manchester bed.	2649	D	4	1.5	35.9	54.7	7.9	.9	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	36.5	55.5	8.0	.9	......	......	......	......	......	......	......	
Laurel Creek, J. L. Hornsby mine, Manchester bed (3 yards in entry).	2650	D	4	1.5	34.8	57.7	6.0	.5	......	......	......	......	......	......	......	Do.
			2	......	35.4	58.5	6.1	.5	......	......	......	......	......	......	......	
Jacks Creek, right fork of, 2½ miles up creek, Fire Clay Rider.	3183	D	4	1.2	27.9	64.9	6.0	.7	......	......	......	......	......	......	......	Do.
			2	......	28.2	65.7	6.1	.7	......	......	......	......	......	......	......	
Same, Oakley Cave, Fire Clay Rider .	3184	D	4	1.0	33.4	59.7	5.9	.4	......	......	......	......	......	......	......	Do.
			2	......	33.7	60.3	6.0	.4	......	......	......	......	......	......	......	
Hun Jackson Branch of Goose Creek, Fire Clay bed.	2647	D	4	1.1	35.6	56.9	6.4	.9	......	......	......	......	......	......	......	Do.
			2	......	36.0	57.5	6.5	.9	......	......	......	......	......	......	......	
Laurel Branch of Sugar Creek of Red Bird Creek, Hazard bed.	3188	D	4	1.8	34.0	57.1	7.1	.7	......	......	......	......	......	......	......	Do.
			2	......	34.6	58.1	7.3	.8	......	......	......	......	......	......	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
FLOYD COUNTY.																	
NOTE.—Samples from Floyd County coal are all from outcrops, or a short distance within entries, along streams.																	
Abbotts Creek, branch of	1784	D	4	3.2	38.8	55.0	3.0	1.3	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	40.1	56.8	3.1	1.3	......	......	......	......	......	......	......	......	
Same, Hatcher's bank	1786	D	4	2.5	38.6	53.4	5.5	1.9	......	......	......	......	......	......	......	......	Do.
			2	......	39.4	55.0	5.6	2.0	......	......	......	......	......	......	......	......	
Beaver Creek, Clear Creek of, R. Reynolds land, Van Lear bed.	......	D	4	1.5	37.4	57.3	3.8	.7	......	......	......	......	......	7,889	14,200	......	Kentucky Geological Survey, 1913.
			2	......	38.0	58.1	3.9	.7	......	......	......	......	......	8,006	14,410	......	
Ned's Branch of Frazier Branch of, J. Johnson land, Dwale coal.	......	D	4	2.0	37.2	56.3	4.5	.7	......	......	......	......	......	7,772	13,990	......	Do.
			2	......	38.0	57.4	4.6	.7	......	......	......	......	......	7,928	14,270	......	
Bill Hall Branch of, Dwale coal	......	D	4	2.6	33.6	60.3	3.5	.7	......	......	......	......	......	......	......	......	Do.
			2	......	34.5	61.9	3.6	.7	......	......	......	......	......	......	......	......	
Otter Creek of, J. Hall land, Van Lear bed.	......	D	4	1.7	34.9	61.1	2.3	.7	......	......	......	......	......	7,972	14,350	......	Do.
			2	......	35.6	62.0	2.4	.7	......	......	......	......	......	8,111	14,600	......	
On left fork of, above Riley Branch, Van Lear bed.	......	D	4	1.6	33.8	55.8	8.8	.7	......	......	......	......	......	7,361	13,250	......	Do.
			2	......	34.4	56.6	9.0	.7	......	......	......	......	......	7,483	13,470	......	
Rock Fork of, B. Howard's land, Van Lear bed.	......	D	4	2.8	37.8	55.2	4.2	.7	......	......	......	......	......	7,678	13,820	......	Do.
			2	......	38.9	56.8	4.3	.8	......	......	......	......	......	7,906	14,230	......	
Spewing Camp Branch of, R. C. Elliott land, Van Lear bed.	......	D	4	1.5	39.1	52.9	6.5	2.2	......	......	......	......	......	7,650	13,770	......	Do.
			2	......	39.7	53.7	6.6	2.2	......	......	......	......	......	7,767	13,980	......	
Stephens Branch of, D. Kennedy land, Van Lear bed.	......	D	4	3.1	36.1	53.0	7.8	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	37.3	54.6	8.1	1.0	......	......	......	......	......	......	......	......	
Caney Fork, right fork of Thornberry Branch of, Van Lear bed.	......	D	4	3.4	36.2	58.4	2.0	.9	......	......	......	......	......	7,661	13,790	......	Do.
			2	......	37.5	60.4	2.1	.9	......	......	......	......	......	7,928	14,270	......	
G. Sloan land, Elkhorn bed	......	D	4	2.2	37.1	57.1	3.6	1.0	......	......	......	......	......	7,733	13,920	......	Do.
			2	......	38.0	58.3	3.7	1.1	......	......	......	......	......	7,906	14,230	......	
On left, below mouth of right fork, Elkhorn bed.	......	D	4	2.9	36.5	56.1	4.5	.7	......	......	......	......	......	7,583	13,650	......	Do.
			2	......	37.7	57.7	4.6	.8	......	......	......	......	......	7,811	14,060	......	
Goose Creek, Rock Fork of, R. Webb land, Van Lear bed.	......	D	4	3.5	35.1	57.0	4.4	1.0	......	......	......	......	......	7,628	13,730	......	Do.
			2	......	36.4	59.0	4.6	1.0	......	......	......	......	......	7,906	14,230	......	
Huff Branch of, Elkhorn bed	......	D	4	2.0	36.4	56.9	4.7	1.3	......	......	......	......	......	7,728	13,910	......	Do.
			2	......	37.2	58.0	4.8	1.3	......	......	......	......	......	7,889	14,200	......	Do.

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Johnson Fork, Elkhorn bed		D	4	1.5	34.8	56.3	7.4	1.3						7,483	13,470		Do.
			2		35.4	57.0	7.6	1.3						7,600	13,680		
Johns Branch, J. J. Ratliff's land, Elkhorn bed.		D	4	3.0	36.2	56.6	4.2	.7									Do.
			2		37.3	58.3	4.4	.7									Do.
Mill Creek, M. Martin land, Elkhorn bed.		D	4	1.9	35.2	53.8	9.1	.8						7,294	13,130		Do.
			2		35.9	54.8	9.3	.8						7,433	13,380		
Stone Coal Branch, A. Hays land, Van Lear bed.		D	4	3.8	34.4	58.1	3.7	.8						7,533	13,560		Do.
			2		35.8	60.3	3.9	.8						7,833	14,100		
Prestonburg; Preston mine, No. 1 bed	2893	D	4	2.5	36.7	52.3	8.5	1.6						*7,272	13,090		Kentucky Geological Survey, 1910.
			2		37.6	53.7	8.7	1.6						7,456	13,420		
Same	2894	D	4	2.6	37.2	50.8	9.4	.9						*7,150	12,870		Do.
			2		38.1	52.2	9.7	.9						7,339	13,210		
Muddy Creek, 1 mile from Harris bank	1785	D	4	2.5	40.8	53.5	3.2	1.9									Kentucky Geological Survey, 1890.
			2		42.1	54.6	3.3	2.0									
GREENUP COUNTY.																	
Amanda Furnace, No. 6 bed (outcrop)	1494	D	4	4.0	33.6	53.4	9.0	1.3									Do.
			2		35.0	55.6	9.4	1.4									
From branch above the shops at Hunnewell Furnace, No. 6 bed (upper part).	1495	D	4	4.3	35.6	50.2	9.9	5.3									Do.
			2		37.2	52.5	10.3	5.5									
Hunnewell Furnace, 1 mile above, No. 6 bed (new opening).	1497	D	4	3.8	37.7	47.2	11.3	4.2									Do.
			2		39.2	49.0	11.8	4.4									
Hunnewell mine (cannel coal)	1649	D	4	1.5	52.2	40.6	5.7	.8									Do.
			2		53.0	41.2	5.8	.8									
Hunnewell Furnace, near, Cane Creek mine (new opening).	2031	D	4	6.3	32.4	53.3	8.0	1.3									Do.
			2		34.6	56.9	8.5	1.4									
Pennsylvania Furnace, near (drift opening).	1496	D	4	3.2	36.6	53.1	7.1	2.3									Do.
			2		37.8	54.9	7.3	2.3									
Raccoon Furnace	1799	D	4	4.2	30.1	53.7	12.0	.9									Do.
			2		31.4	56.1	12.5	1.0									
Raccoon Creek, No. 1 bed	1648	D	4	4.1	28.9	49.6	17.4	.7									Do.
			2		30.1	51.8	18.1	.7									
Turkey Lick mine (main entry, 180 feet from opening).	1797	D	4	4.6	36.7	52.3	6.4	.7									Do.
			2		38.4	54.9	6.7	.7									Do.
HARLAN COUNTY.																	
Ages; Brookside mine, Harlan bed (rib at face, 1 right entry, 1 main entry, 1,200 feet southeast of mine mouth).	81528	A	1	3.1	36.9	56.1	3.9	.8					1.5	7,756	13,960	+2,740	Bureau of Mines.
Same (rib of face, 2 right entry, 1 main entry, 1,500 feet east of mine mouth).	81529	A	1	2.8	37.2	56.0	4.0	1.1					1.3	7,717	13,890	+2,740	Do.
Same (face of 3 right entry, 1 main entry, 2,200 feet northeast of mine mouth).	81530	A	1	2.6	37.8	55.8	3.8	.9					1.1	7,828	14,090	+2,740	Do.
Same (rib at face, 1 main entry, 2,600 feet northeast of mine mouth).	81531	A	1	2.9	36.4	56.7	4.0	.9					1.5	7,750	13,950	2,560	Do.
Same (face of 2 left entry, 1 main entry, 1,400 feet north of mine mouth).	81532	A	1	2.4	36.5	55.2	5.9	1.4					1.0	7,655	13,780	2,420	Do.
Same (composite of samples 81528 to 81532, inclusive).	81533	A	1	2.8	37.0	55.9	4.3	1.1	5.5	77.6	1.6	9.9	1.3	7,750	13,950		Do.
			2		38.0	57.6	4.4	1.1	5.4	79.8	1.6	7.7		7,972	14,350		
			3		39.8	60.2		1.1	5.6	83.5	1.7	8.1		8,339	15,010		

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELDS—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HARLAN COUNTY—continued.																	
Benham; Benham mine, "C" or Kellioka bed (face of 3 right entry, 1 left entry, face heading).	24834	A	1	2.6	36.8	58.5	2.1	.5					.8	8,100	14,580		Bureau of Mines, 1918.
Same (face of 3 room, 2 right entry, 2 left entry, face heading).	24835	A	1	2.6	37.3	58.3	1.8	.5					.6	8,124	14,620		Do.
Same (face of 8 room, 1 left entry, 2 right entry, face heading).	24836	A	1	2.7	37.0	58.1	2.2	.5					.8	8,094	14,570	2,200	Do.
Same (face of 7 room, 3 left entry, 1 right entry, face heading).	24837	A	1	2.6	37.8	56.7	2.9	.3					.7	8,050	14,490		Do.
Same (composite of samples 24834 to 24837, inclusive).	24838	A	1	2.5	37.5	57.6	2.4	.5	5.6	80.9	1.5	9.1	.7	8,106	14,590		Do.
			2		38.5	59.1	2.4	.5	5.4	83.0	1.6	7.1		8,311	14,960		
			3		39.4	60.6		.5	5.6	85.1	1.6	7.2		8,517	15,330		
Big Black Mountain; 1 mile south of Gillam's Rock House, High Splint bed, Prospect pit (73¼-inch cut).	2271	B	1	4.5	36.3	56.0	3.2	.5					2.1				U. S. Geological Survey, 1906.
			2		38.0	58.6	3.4	.6									
Same (Gillam's Rock House, 25 feet from outcrop, 58½-inch cut).	2272	B	1	4.7	35.8	57.0	2.5	.5					2.5				Do.
			2		37.5	59.9	2.6	.6									
Same (weathered sample)	2270	B	1	4.3	36.0	57.4	2.3	.5					2.2	7,844	14,120		Do.
			2		37.7	59.9	2.4	.5						8,200	14,760		
Chevrolet; Crown by-product mine, Harlan bed (rib of face, 2 main entry, 1,500 feet north 20° east of No. 2 mine mouth).	81893	A	1	2.5	36.7	56.9	3.9	.7					1.5	7,794	14,030	+2,740	Bureau of Mines.
Same (face of 1 left entry, 2 main entry, 1,400 feet north 60° east of mine mouth).	81894	A	1	2.5	37.6	56.5	3.4	.8					1.5	7,894	14,210	+2,740	Do.
Same (face of 5 main entry, 1,200 feet east of No. 2 mine mouth).	81895	A	1	2.5	37.7	56.9	2.9	.7					1.5	7,900	14,220	+2,740	Do.
Same (face of 1 butt entry, 2,000 feet north 45° east of No. 1 mine mouth).	81896	A	1	2.7	36.8	57.2	3.3	.8					1.8	7,856	14,144	2,510	Do.
Same (rib at face, 1 right entry, 1 main entry, 1,300 feet north 30° east of mine mouth).	81897	A	1	2.6	36.7	56.9	3.8	.8					1.6	7,850	14,130	2,480	Do.
Same (rib at face, 3 right entry, 1 main entry, 1,300 feet north 15° east of mine mouth).	81898	A	1	2.6	36.6	57.0	3.8	.9					1.6	7,817	14,070	2,570	Do.

Same (composite of samples 81893 to 81898, inclusive).	81899	A	1	2.6	36.6	57.3	3.5	.8	5.6	79.0	1.6	9.5	1.6	7,850	14,130	....	Do.
			2	......	37.7	58.7	3.6	.8	5.4	81.1	1.7	7.4	......	8,056	14,500	....	
			3	......	39.1	60.9	......	.8	5.6	84.1	1.7	7.8	......	8,356	15,040	....	
Coalgood; Mary Helen mine, Harlan bed (face of 2 north entry, 1,400 feet northeast of No. 2 mine mouth).	81739	A	1	2.2	37.2	56.7	2.9	.9	......	......	......	......	1.9	7,817	14,070	+2,740	Do.
Same (face of 3 right entry, 2 drift entry, 1,700 feet northeast of No. 2 mine mouth).	81740	A	1	2.7	36.8	56.5	4.0	.9	......	......	......	......	1.4	7,794	14,030	+2,740	Do.
Same (face of 19 room, 1 drift entry, 1,100 feet east of mine mouth).	81741	A	1	2.9	37.7	56.6	2.8	.8	......	......	......	......	1.5	7,883	14,190	+2,740	Do.
Same (face of 2 drift entry, 1,800 feet north 29° west of mine mouth).	81742	A	1	3.0	38.0	55.8	3.2	.9	......	......	......	......	1.3	7,872	14,170	+2,740	Do.
Same (face of air course, 2 left entry, 4 drift entry, 1,150 feet south of mine mouth).	81743	A	1	3.1	37.2	56.7	3.0	.9	......	......	......	......	1.4	7,861	14,150	+2,740	Do.
Same (face of 2 south entry, 900 feet south of mine mouth).	81744	A	1	2.9	37.4	56.3	3.4	.8	......	......	......	......	1.3	7,828	14,090	2,680	Do.
Same (composite of samples 81739 to 81744, inclusive).	81745	A	1	2.9	37.5	56.2	3.4	.9	5.6	78.8	1.7	9.6	1.4	7,833	14,100	....	Do.
			2	......	38.6	57.9	3.5	.9	5.5	81.2	1.7	7.2	......	8,072	14,530	....	
			3	......	40.0	60.0	......	.9	5.6	84.1	1.8	7.6	......	8,356	15,040	....	
Coxton; Kayn mine, Harlan bed (rib at face of 5 right entry, 2 main entry, 3,100 feet northeast of mine mouth).	81523	A	1	2.7	37.7	56.2	3.4	.8	......	......	......	......	1.3	7,822	14,080	2,680	Do.
Same (face of 7 right entry, 2 main entry, 3,000 feet north of mine mouth).	81524	A	1	2.8	36.9	56.8	3.5	.9	......	......	......	......	1.2	7,789	14,020	2,240	Do.
Same (face of 2 main entry, 3,000 feet north of mine mouth).	81525	A	1	3.5	35.6	57.1	3.8	.8	......	......	......	......	2.0	7,683	13,830	2,340	Do.
Same (room pillar, 5 right entry, 1 main entry, 2,000 feet northeast of mine mouth).	81526	A	1	2.9	36.8	55.5	4.8	.7	......	......	......	......	1.2	7,633	13,740	2,390	Do.
Same (composite of samples 81523 to 81526, inclusive).	81527	A	1	3.0	36.7	56.4	3.9	.9	5.5	78.1	1.7	9.9	1.4	7,750	13,950	....	Do.
			2	......	37.8	58.2	4.0	.9	5.4	80.5	1.7	7.5	......	7,989	14,380	....	
			3	......	39.4	60.6	......	1.0	5.6	83.9	1.8	7.7	......	8,317	14,970	....	
Evarts; Harlan Cooperative No. 1 mine, Darby or C bed (face of straight butt entry, 600 feet southwest of mine mouth).	81534	A	1	3.9	37.8	54.1	4.2	.8	......	......	......	......	2.2	7,622	13,720	2,290	Do.
Same (rib near face of 1 left entry, 1 right entry, 500 feet northwest of mine mouth).	81535	A	1	2.9	36.5	57.3	3.3	.7	......	......	......	......	1.0	7,822	14,080	2,450	Do.
Same (rib at face of 1 right entry, main face entry, 800 feet south of mine mouth).	81536	A	1	3.0	37.3	56.3	3.4	.8	......	......	......	......	1.3	7,761	13,970	2,340	Do.
Same (face of 1 room, 1 right entry, main face entry, 700 feet south of mine mouth).	81537	A	1	2.9	38.0	55.8	3.3	.7	......	......	......	......	1.3	7,817	14,070	2,510	Do.
Same (composite of samples 81534 to 81537, inclusive).	81538	A	1	3.2	36.6	56.6	3.6	.7	5.5	77.9	1.6	10.7	1.5	7,772	13,990	....	Do.
			2	......	37.8	58.5	3.7	.8	5.4	80.5	1.7	7.9	......	8,033	14,460	....	
			3	......	39.2	60.8	......	.8	5.6	83.5	1.7	8.4	......	8,339	15,010	....	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HARLAN COUNTY—continued.																	
Grays Knob; Mill Creek mine, Smith 11-foot bed (face of 2 right entry, 1 main entry, 1,800 feet south of mine mouth).	81693	A	1	4.0	34.3	54.0	7.7	1.1	......	......	......	......	1.7	7,228	13,010	+2,740	Bureau of Mines.
Same (face of 3 right entry, 1 main entry, 1,800 feet south 10° east of mine mouth).	81733	A	1	4.0	35.2	52.6	8.2	1.1	......	......	......	......	1.8	7,183	12,930	2,280	Do.
Same (face of 4 right entry, 1 main entry, 1,800 feet south 20° east of mine mouth).	81734	A	1	4.1	35.8	52.1	8.0	1.0	......	......	......	......	1.9	7,161	12,890	2,570	Do.
Same (face of 1 main entry, 2,100 feet south 50° east of mine mouth).	81735	A	1	4.2	35.3	51.8	8.7	.9	......	......	......	......	2.3	7,089	12,760	+2,740	Do.
Same (face of 6 right entry, 1 main entry, 2,000 feet south 40° east of mine mouth).	81736	A	1	3.9	33.7	53.9	8.5	.9	......	......	......	......	2.1	7,144	12,860	+2,740	Do.
Same (face of last crosscut, 5 right entry, 1 main entry, 1,900 feet south 30° east of mine mouth).	81737	A	1	4.4	35.1	53.5	7.0	.8	......	......	......	......	2.7	7,233	13,020	2,740	Do.
Same (composite of samples 81693 and 81733 to 81737, inclusive).	81738	A	1	4.0	34.5	53.4	8.1	.9	5.4	72.7	1.7	11.3	2.1	7,161	12,890	....	Do.
			2	......	35.9	55.6	8.5	1.0	5.1	75.7	1.7	8.0	......	7,461	13,430	....	
			3	......	39.2	60.8	......	1.1	5.6	82.7	1.9	8.7	......	8,150	14,670	....	
Harlan; 2 miles east of; Clover Fork mine, Harlan bed (25 pillar, 7 left entry).	24728	A	1	2.0	39.3	55.6	3.1	.8	......	......	......	......	.4	7,989	14,380	2,510	Bureau of Mines, 1918.
Same (face of 7 left air course)........	24729	A	1	3.8	37.1	56.6	2.5	.7	......	......	......	......	2.1	7,900	14,220	2,930	Do.
Same (face of 9 left entry)...........	24730	A	1	3.4	37.4	56.5	2.7	.8	......	......	......	......	1.7	7,911	14,240	....	Do.
Same (face of 7 right entry)..........	24731	A	1	3.4	37.5	56.1	3.0	.6	......	......	......	......	1.7	7,878	14,180	2,720	Do.
Same (composite of samples 24728 to 24731, inclusive).	24732	A	1	3.6	37.2	56.5	2.7	.7	5.5	79.6	1.6	9.9	1.8	7,900	14,220	....	Do.
			2	......	38.6	58.6	2.8	.7	5.3	82.6	1.7	6.9	......	8,194	14,750	....	
			3	......	39.7	60.3	......	.8	5.5	84.9	1.7	7.1	......	8,428	15,170	....	
4 miles east of; Coxton mine, Harlan bed (face of 22 room, 1 right entry).	24713	A	1	3.7	36.4	56.2	3.7	1.3	......	......	......	......	2.0	7,817	14,090	....	Do.
Same (face of 17 room, 4 right entry)..	24714	A	1	2.8	38.0	55.7	3.5	.8	......	......	......	......	1.5	7,883	14,190	2,550	Do.
Same (face of 5 left entry)............	24715	A	1	3.0	37.0	56.7	3.3	.9	......	......	......	......	1.8	7,867	14,160	2,560	Do.
Same (face of 2 room, 3 left entry).....	24716	A	1	3.0	36.9	57.1	3.0	.7	......	......	......	......	1.3	7,933	14,280	....	Do.

Same (composite of samples 24713 to 24716, inclusive).	24717	A	1	3.2	37.2	56.3	3.3	.9	5.5	78.9	1.7	9.7	1.6	7,861	14,150	....	Do.
			2	......	38.4	58.2	3.4	1.0	5.3	81.5	1.7	7.1	......	8,117	14,610	....	
			3	......	39.8	60.2	......	1.0	5.5	84.4	1.8	7.3	......	8,406	15,130	....	
1 mile east of; Gaston mine, Harlan bed (face of 4 right entry).	24633	A	1	3.2	37.5	56.4	2.9	.5	......	......	......	......	1.6	7,911	14,240	....	Do.
Same (face of main haulage way)......	24634	A	1	3.0	37.9	56.5	2.6	.6	......	......	......	......	1.4	7,961	14,330	....	Do.
Same (composite of samples 24633 and 24634).	24635	A	1	3.3	37.9	56.1	2.7	.6	5.6	79.6	1.7	9.8	1.5	7,950	14,310	....	Do.
			2	......	39.2	58.0	2.8	.6	5.4	82.3	1.7	7.2	......	8,222	14,800	....	
			3	......	40.3	59.7	......	.6	5.6	84.7	1.8	7.3	......	8,456	15,220	....	
3 miles east of; Wood mine, Harlan bed (face of 5 right entry).	24770	A	1	3.1	35.7	55.5	5.7	1.4	......	......	......	......	1.1	7,617	13,710	2,600	Do.
Same (face of 3 right air course).......	24771	A	1	3.9	36.0	55.9	4.2	.6	......	......	......	......	1.7	7,733	13,920	+3,010	Do.
Same (face of 4 right entry)...........	24772	A	1	3.4	36.2	54.8	5.6	.7	......	......	......	......	1.5	7,633	13,740	2,910	Do.
Same (composite of samples 24771 and 24772).	24773	A	1	3.6	36.0	55.4	5.0	.7	5.4	77.8	1.6	9.5	1.6	7,678	13,820	....	Do.
			2	......	37.3	57.5	5.2	.7	5.2	80.7	1.7	6.5	......	7,967	14,340	....	
			3	......	39.4	60.6	......	.8	5.5	85.1	1.7	6.9	......	8,400	15,120	....	
R. C. Tway mine, Harlan bed (face of 3 main entry, 4,500 feet south 75° east of mine mouth).	82061	A	1	2.7	37.7	57.1	2.5	.7	......	......	......	......	1.7	7,956	14,320	2,570	Bureau of Mines.
Same (face of 6 left entry, 3 main entry, 4,200 feet east of mine mouth).	82062	A	1	2.6	36.9	57.5	3.0	.7	......	......	......	......	1.7	7,917	14,250	+2,740	Do.
Same (rib of left crosscut, 4 main entry, 4,300 feet north 60° east of mine mouth).	82063	A	1	2.7	37.0	55.9	4.4	.7	......	......	......	......	1.7	7,789	14,020	+2,740	Do.
Same (face of 8 right entry, 2 main entry, 4,000 feet south 50° east of mine mouth).	82064	A	1	2.7	36.7	57.8	2.8	.7	......	......	......	......	1.7	7,920	14,220	2,740	Do.
Same (face of 2 main entry, 4,000 feet south 60° east of mine mouth).	82065	A	1	2.7	37.0	56.9	3.4	.7	......	......	......	......	1.8	7,894	14,210	+2,740	Do.
Same (composite of samples 82061 to 82065, inclusive).	82066	A	1	2.8	37.4	56.6	3.2	.7	5.6	79.4	1.9	9.2	1.7	7,872	14,170	....	Do.
			2	......	38.4	58.3	3.3	.7	5.5	81.7	2.0	6.8	......	8,094	14,570	....	
			3	......	39.7	60.3	......	.7	5.7	84.5	2.0	7.1	......	8,372	15,070	....	
High Splint; Harlan No. 1 mine, Harlan bed (face of 1 main entry, 2,100 feet south 20° east of mine mouth)	81753	A	1	2.8	37.3	52.6	7.3	1.1	......	......	......	......	1.7	7,472	13,450	2,740	Do.
Same (face of 3 left entry, 1 main entry, 1,300 feet south 45° east of mine mouth).	81694	A	1	2.8	37.5	54.6	5.1	1.2	......	......	......	......	1.2	7,722	13,900	2,710	Do.
Same (face of 3 right entry, 1 main entry, 1,700 feet south 10° west of mine mouth).	81695	A	1	2.6	36.7	55.6	5.1	1.2	......	......	......	......	1.0	7,611	13,700	2,680	Do.
Same (face of last crosscut, 1 right entry, 1 main entry, 1,500 feet south 45° west of mine mouth).	81696	A		2.7	37.9	54.3	5.1	1.1	......	......	......	......	1.0	7,733	13,920	+2,740	Do.
Same (composite of samples 81753 and 81694 to 81696, inclusive).	81697	A	1	2.9	37.2	53.9	6.0	1.2	5.6	76.4	1.8	9.0	1.2	7,617	13,710	....	Do.
			2	......	38.3	55.6	6.1	1.2	5.4	78.7	1.8	6.8	......	7,844	14,110	....	
			3	......	40.8	59.2	......	1.3	5.8	83.8	2.0	7.1	......	8,350	15,030	....	
High Splint mine, High Splint bed (rib at face of entry, 6 main entry, 2,600 feet northeast of No. 1 mine mouth).	81698	A	1	4.6	35.5	53.8	6.1	.7	......	......	......	......	2.2	7,339	13,210	+2,740	Do.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HAFLAN COUNTY—continued.																	
High Splint; Harlan No. 1 mine, Harlan bed. Same (rib at face of 5 drift entry, 2,200 feet northeast of No. 1 mine mouth).	81699	A	1	4.7	35.7	51.5	8.1	.8	......	......	......	......	2.7	7,133	12,840	+2,740	Bureau of Mines.
Same (rib at face of 4 drift entry, 1,800 feet northeast of No. 1 mine mouth).	81700	A	1	5.0	36.0	53.9	5.1	.7	......	......	......	......	3.0	7,372	13,270	+2,740	Do.
Same (face of 2 drift entry, 1,100 feet northeast of No. 1 mine mouth).	81701	A	1	4.7	36.4	54.2	4.7	.7	......	......	......	......	2.7	7,422	13,360	2,680	Do.
Same (composite of samples 81698 to 81701, inclusive).	81702	A	1	4.8	35.8	53.4	6.0	.7	5.5	74.1	1.3	12.4	2.7	7,317	13,170	....	Do.
			2	......	37.6	56.1	6.3	.8	5.2	77.8	1.3	8.6	......	7,683	13,830	....	
			3	......	40.1	59.9	......	.8	5.6	83.1	1.4	9.1	......	8,206	14,770	....	
Kitts; Golden Ash mine, Harlan bed (face of 2 main entry, 2,000 feet north of mine mouth).	81518	A	1	3.9	36.5	56.0	3.6	.8	......	......	......	......	2.2	7,728	13,910	2,450	Do.
Same (rib near face of 5 right entry, 2,700 feet north of mine mouth).	81519	A	1	3.9	37.3	53.1	5.6	.7	......	......	......	......	2.3	7,489	13,480	2,390	Do.
Same (pillar, room 58, 6 left entry, 2,600 feet northwest of mine mouth).	81520	A	1	3.1	36.9	57.3	2.7	.7	......	......	......	......	1.6	7,867	14,160	2,680	Do.
Same (face of last crosscut, 2 right entry, 1,100 feet northeast of mine mouth).	81521	A	1	3.1	37.1	56.3	3.5	.6	......	......	......	......	1.6	7,822	14,080	2,240	Do.
Same (composite of samples 81518 to 81521, inclusive).	81522	A	1	3.5	36.6	56.1	3.8	.8	5.6	77.6	1.6	10.6	1.9	7,705	13,870	....	Do.
			2	......	38.0	58.0	4.0	.8	5.4	80.5	1.7	10.6	......	7,983	14,370	....	
			3	......	39.5	60.5	......	.8	5.6	83.8	1.8	8.0	......	8,317	14,970	....	
Rex mine, Harlan bed (face of 9 right entry, 3,000 feet northwest of mine mouth).	81513	A	1	3.0	36.8	57.2	3.0	.8	......	......	......	......	1.2	7,878	14,180	2,570	Do.
Same (face of 12 right entry, 3,600 feet northwest of mine mouth).	81514	A	1	3.3	36.4	58.0	2.3	1.0	......	......	......	......	1.5	7,867	14,160	2,450	Do.
Same (face of 14 room, 10 left entry, 3,400 feet northwest of mine mouth).	81515	A	1	3.0	37.2	57.3	2.5	.7	......	......	......	......	1.4	7,911	14,240	2,680	Do.
Same (pillar of 8 room, 8 right entry, 2,400 feet northwest of mine mouth).	81516	A	1	3.1	36.9	56.7	3.3	.8	......	......	......	......	1.5	7,806	14,050	+2,740	Do.
Same (composite of samples 81513 to 81516, inclusive).	81517	A	1	3.1	37.1	57.0	2.8	.8	5.6	79.0	1.7	10.1	1.4	7,878	14,180	....	Do.
			2	......	38.3	58.8	2.9	.8	5.4	81.6	1.8	7.5	......	8,133	14,640	....	
			3	......	39.4	60.6	......	.8	5.6	84.0	1.8	7.8	......	8,367	15,060	....	

Liggett; Mahan-Ellison mine, Harlan bed (rib at face of 2 butt entry, 700 feet northeast of No. 1 mine mouth).	81729	A	1	3.6	35.5	57.3	3.6	.9	......	......	......	......	1.5	7,789	14,020	+2,740	Do.
Same (rib at face, 2 butt air course, 750 feet northeast of No. 1 mine mouth).	81730	A	1	3.4	35.0	56.6	5.0	.9	......	......	......	......	1.7	7,622	13,720	2,740	Do.
Same (face of last crosscut, 1 left entry, 500 feet northeast of No. 1 mine mouth).	81731	A	1	3.4	35.2	57.8	3.6	.8	......	......	......	......	1.5	7,767	13,980	2,680	Do.
Same (composite of samples 81729 to 81731, inclusive).	81732	A	1	3.4	35.1	57.5	4.0	.8	5.5	78.0	1.6	10.1	1.6	7,722	13,900	......	
			2	......	36.4	59.4	4.2	.9	5.3	80.7	1.7	7.2	......	7,994	14,390	......	
			3	......	38.0	62.0	......	.9	5.6	84.2	1.8	7.5	......	8,339	15,010	......	
Perkins-Harlan No. 1 mine, Harlan bed (rib at face 1 main entry, 600 feet south 45° west of mine mouth).	81703	A	1	3.6	37.0	56.7	2.7	.7	......	......	......	......	2.1	7,800	14,040	2,540	Do.
Same (face of 3 butt entry, 900 feet north 30° west of mine mouth).	81704	A	1	4.5	36.2	57.3	2.0	.7	......	......	......	......	3.1	7,811	14,060	2,570	Do.
Same (face of last room, 1 butt entry, 800 feet west of mine mouth).	81705	A	1	3.3	38.7	57.0	2.0	.7	......	......	......	......	2.0	7,878	14,180	2,540	Do.
Same (rib at face 2 butt entry, 700 feet north 60° west of mine mouth).	81706	A	1	3.2	37.0	57.2	2.6	.8	......	......	......	......	1.8	7,861	14,150	2,680	Do
Same (composite of samples 81703 to 81706, (inclusive).	81707	A	1	3.7	36.9	57.0	2.4	.8	5.7	78.8	1.6	10.7	2.2	7,828	14,090	......	Do.
			2	......	38.3	59.3	2.4	.8	5.5	81.8	1.6	7.9	......	8,122	14,620	......	
			3	......	39.3	60.7	......	.8	5.7	83.9	1.7	7.9	......	8,328	14,990	......	
Lejunior; Berger No. 1 mine, Harlan bed (rib at face of 3 right entry, 2 main entry, 1,500 feet south of mine mouth).	81688	A	1	3.0	36.2	55.6	5.2	1.2	......	......	......	......	1.3	7,694	13,850	2,740	Do.
Same (face of 2 main entry, 1,800 feet south of mine mouth).	81689	A	1	2.8	37.2	54.1	5.9	1.3	......	......	......	......	1.1	7,644	13,760	2,510	Do.
Same (face of 3 left entry, 2 main entry, 1,400 feet southeast of mine mouth).	81690	A	1	2.7	37.6	53.8	5.9	1.2	......	......	......	......	.9	7,650	13,770	+2,740	Do.
Same (pillar of 6 room, 2 left entry, 1 main entry, 800 feet southeast of mine mouth).	81691	A	1	3.3	35.6	54.9	6.2	1.0	......	......	......	......	1.5	7,539	13,570	2,740	Do.
Same (composite of samples 81688 to 81691, inclusive).	81692	A	1	3.0	36.3	55.0	5.7	1.1	5.5	76.6	1.6	9.5	2.2	7,617	713,710	......	Do.
			2	......	37.4	56.7	5.9	1.1	5.3	79.0	1.6	7.1	......	7,844	14,120	......	
			3	......	39.7	60.3	......	1.2	5.6	83.9	1.7	7.6	......	8,339	15,010	......	
Twila; Creech No. 1 mine, Wallins bed (face of 3 room, 3 left entry, 1 left main entry, 2,000 feet south 20° east of mine mouth).	81900	A	1	2.7	40.4	53.9	3.0	.7	......	......	......	......	1.9	7,694	13,850	2,240	Do.
Same (face of 5 right entry, 1 main entry, 2,000 feet south of mine mouth).	81901	A	1	3.4	39.0	54.2	3.4	.7	......	......	......	......	2.2	7,669	13,800	2,240	Do.
Same (rib at face of 4 right entry, 1 left main entry, 2,000 feet south 10° west of mine mouth).	81902	A	1	3.1	37.8	55.1	4.0	.8	......	......	......	......	2.4	7,611	13,700	2,240	Do.
Same (face of last cross cut, 2 right entry, left main entry, 1,800 feet south 45° west of mine mouth).	81903	A	1	3.5	38.1	55.3	3.1	.6	......	......	......	......	2.6	7,672	13,810	2,470	Do.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELDS—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HARLAN COUNTY—continued.																	
Twila; Creech No. 1 mine, Wallins bed, (pillar of 13 room, 1 right entry, 1 left main entry, 1,000 feet south 70° W. of mine mouth).	81904	A	1	3.3	38.7	54.7	3.3	.8	......	......	......	......	2.1	7,711	13,880	2,220	Bureau o Mines.
Same (rib at face of 1 butt entry, right main entry, 2,200 feet west of mine mouth).	81905	A	1	3.4	39.0	54.2	3.4	.8	......	......	......	......	2.1	7,667	13,800	2,190	Do.
Same (composite of samples 81900 to 81905, inclusive).	81906	A	1	3.3	39.1	54.3	3.3	.7	5.7	77.2	2.0	11.1	2.2	7,678	13,820	......	Do.
			2	......	40.4	56.2	3.4	.8	5.5	79.8	2.1	8.4	......	7,939	14,290	......	
			3	......	41.9	58.1	......	.8	5.7	82.7	2.1	8.7	......	8,217	14,790	......	
Creech No. 2 mine, Wallins bed (rib at face of 24 room, 2 main butt heading, 1,400 feet south 80° west of mine mouth).	82056	A	1	2.9	38.0	53.6	5.5	1.0	......	......	......	......	1.8	7,494	13,490	2,510	Do.
Same (on left of 2 room, 2 main butt heading, 1,400 feet south 75° west of mine mouth).	82057	A	1	3.0	39.0	53.7	4.3	1.0	......	......	......	......	1.7	7,633	13,740	2,450	Do.
Same (rib at face of 1 left entry, 2 butt heading, 1,000 feet south 70° west of mine mouth).	82058	A	1	3.0	38.4	53.7	4.9	1.0	......	......	......	......	1.9	7,578	13,640	2,510	Do.
Same (rib at right face, 2 butt heading, 1,300 feet north 70° west of mine mouth).	82059	A	1	3.0	38.0	54.3	4.7	.9	......	......	......	......	1.8	7,600	13,680	2,510	Do.
Same (composite of samples 82056 to 82059, inclusive).	82060	A	1	3.1	37.7	54.4	4.8	1.0	5.4	75.3	1.9	11.6	1.8	7,583	13,650	......	Do.
			2	......	38.9	56.2	4.9	1.0	5.3	77.7	2.0	9.1	......	7,822	14,080	......	
			3	......	40.9	59.1	......	1.1	5.5	81.7	2.1	9.6	......	8,233	14,820	......	
NOTE.—Coals below were sampled at outcrops and in short entries along the waters of Poor Fork and Clover Fork.																	
Poor Fork, near mine on the Anthony Blair tract.	4525	B	1	6.3	33.0	58.2	2.5	.5	......	......	......	......	4.5	......	......	......	U. S. Geological Survey, 1913.
			2	......	35.2	62.1	2.7	.6	......	......	......	......	......	......	......	......	
Mine on the C. Blair tract.	4527	B	1	8.3	30.7	57.4	3.6	.6	......	......	......	......	5.6	......	......	......	Do.
			2	......	33.5	62.5	4.0	.6	......	......	......	......	......	......	......	......	

Mine on the John Creek tract........	4528	B	1	3.4	36.0	57.1	3.5	.7	.....	.....	.....	.....	1.7	.....	.....	.....	Do.
			2	......	37.3	59.1	3.6	.7	.....	.....	.....	.....	.....	.....	.....	.....	
Mine on the Rebecca Creek tract.....	4526	B	1	4.9	33.6	58.0	3.5	.6	.....	.....	.....	.....	3.2	.....	.....	.....	Do.
			2	......	35.3	61.0	3.7	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Slick Rock Branch of Big Looney Creek, Keokee bed.	2669	D	4	3.4	31.1	62.5	3.0	.4	.....	.....	.....	.....	.....	.....	.....	.....	Kentucky Geological Survey, 1912.
			2	......	32.2	64.7	3.1	.4	.....	.....	.....	.....	.....	.....	.....	.....	
Same, Leonard bed..................	2673	D	4	2.5	34.3	58.7	4.5	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	35.2	60.2	4.6	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Same, McKnight bed................	2887	D	4	9.6	30.2	50.1	10.1	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	33.4	55.4	11.2	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Bear's Lettuce Howwow on Big Looney Creek, Limestone Coal bed.	2863	D	4	3.0	31.4	56.3	9.3	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	32.4	58.0	9.6	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Fickle Cove of Gib Looney Creek, High Splint bed (weathered).	2882	D	4	1.9	28.9	61.1	8.1	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	29.5	62.2	8.3	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Mulberry Branch on Big Looney Creek, Keokee bed.	2478b	D	4	1.5	35.3	61.8	1.4	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	35.9	62.7	1.4	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Camp Fork at head of Big Looney Creek, Limestone bed.	2883	D	4	3.2	28.1	60.4	8.3	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	29.0	62.4	8.6	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Clover Lick Creek, Keokee bed.......	2668	D	4	1.1	33.7	63.1	2.1	.4	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	34.1	63.8	2.1	.4	.....	.....	.....	.....	.....	.....	.....	.....	
Same................................	2671	D	4	1.4	32.2	57.2	9.2	.7	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	32.7	58.0	9.3	.8	.....	.....	.....	.....	.....	.....	.....	.....	
Same, Leonard bed, Old Branson entry.	2710	D	4	1.3	37.1	58.2	3.4	1.3	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	37.6	59.0	3.4	1.3	.....	.....	.....	.....	.....	.....	.....	.....	
Same, Bank Branch of the right fork of, High Splint bed.	2478a	D	4	2.6	35.6	58.6	3.2	.5	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	36.6	60.1	3.3	.5	.....	.....	.....	.....	.....	.....	.....	.....	
Garner Branch, Cornet bed (weathered coal).	2676	D	4	6.1	32.7	58.2	3.0	.8	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	34.8	62.0	3.2	.4	.....	.....	.....	.....	.....	.....	.....	.....	
Perkins Branch, Ebenezer Dickson tract, Harlan bed (weathered).	2670	D	4	1.6	35.0	57.4	6.0	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	35.6	58.3	6.1	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Turkey Pen Branch, J. L. Cornett land, Keokee bed.	2890	D	4	2.3	31.5	61.6	4.6	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	32.2	63.1	4.7	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Straight Creek, mouth of............	2696	D	4	5.9	33.0	56.6	4.5	.7	.....	.....	.....	.....	.....	6,939	12,490	.....	Kentucky Geological Survey, 1910.
			2	......	35.0	60.2	4.8	.7	.....	.....	.....	.....	.....	7,378	13,280	.....	Do.
Clover Fork, Bear Branch of, Keokee bed.	2,690	D	4	2.5	31.9	61.2	4.4	.5	.....	.....	.....	.....	.....	.....	.....	.....	Kentucky Geological Survey, 1912.
			2	......	32.8	62.7	4.5	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Right fork of, Breeding Creek, High Splint bed.	2694	D	4	2.1	37.3	57.7	2.9	.6	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	38.1	58.9	3.0	.6	.....	.....	.....	.....	.....	.....	.....	.....	
Buck Lick Branch of Child's Creek, Dean bed.	2687	D	4	2.2	33.5	55.7	8.6	.7	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	34.3	56.9	8.8	.7	.....	.....	.....	.....	.....	.....	.....	.....	
Same, Ben Parsons Land, Low Splint bed.	2688	D	4	1.8	35.0	57.3	5.9	1.0	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	35.6	58.4	6.0	1.0	.....	.....	.....	.....	.....	.....	.....	.....	
Childs Creek, ½ mile west of Childs Gap, High Splint bed.	2691 2692	D	4	3.5	35.8	56.0	4.7	1.0	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	37.1	58.0	4.9	1.1	.....	.....	.....	.....	.....	.....	.....	.....	
Fugit Creek, between Grassy and Windy Forks, Isaac Creech house, High Splint bed.	2702	D	4	1.6	35.0	60.8	2.6	.8	.....	.....	.....	.....	.....	.....	.....	.....	Do.
			2	......	35.6	61.7	2.7	.9	.....	.....	.....	.....	.....	.....	.....	.....	
Kanah Winn Branch, High Splint bed.	2695	D	4	1.8	37.1	56.1	4.4	1.0	.....	.....	.....	.....	.....	.....	.....	.....	
			2	......	37.8	57.7	4.5	1.0	.....	.....	.....	.....	.....	.....	.....	.....	Do.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HARLAN COUNTY—continued.																	
Clover Fork, Seagrave Creek, High Splint bed.	2697	D	4	3.1	36.1	56.6	4.2	.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	37.3	58.4	4.3	.8	......	......	......	......	......	......	......	......	
Same, 1¼ miles up creek, on the right, Keokee bed.	2700	D	4	1.5	34.9	60.7	2.9	.6	......	......	......	......	......	......	......	......	Do.
			2	......	35.4	61.7	2.9	.6	......	......	......	......	......	......	......	......	
Same, in Slip Hollow, Dean bed......	2701	D	4	4.6	29.2	55.2	11.0	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	30.6	57.9	11.5	1.0	......	......	......	......	......	......	......	......	
Same, on right of creek, Isaac Creech tract, Leonard bed.	2685	D	4	1.6	31.8	63.2	3.4	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	32.3	64.2	3.5	1.3	......	......	......	......	......	......	......	......	
Sharps Branch of Yokum Creek, Horse Hollow, Keokee bed.	2682	D	4	1.5	35.3	60.2	3.0	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	35.8	61.2	3.0	1.1	......	......	......	......	......	......	......	......	
Steep Hollow Branch, Leonard bed...	2870	D	4	3.6	29.4	57.0	10.0	.6	......	......	......	......	......	......	......	......	Do.
			2	......	30.5	59.1	10.4	.6	......	......	......	......	......	......	......	......	
Same, John M. Smith land, Keokee "cannel coal."	2703	D	4	1.6	42.6	46.5	9.3	.6	......	......	......	......	......	......	......	......	Do.
			2	......	43.3	47.2	9.5	.6	......	......	......	......	......	......	......	......	
Franks Creek of Yokum Creek, Keokee bed.	2707	D	4	1.4	33.6	62.8	2.2	.9	......	......	......	......	......	......	......	......	Do.
			2	......	34.1	63.7	2.2	.9	......	......	......	......	......	......	......	......	
Yokum Creek, Wright Winn's land, Dean bed.	2683	D	4	1.5	33.0	52.0	13.5	.7	......	......	......	......	......	......	......	......	Do.
			2	......	33.5	52.8	13.7	.7	......	......	......	......	......	......	......	......	
JACKSON COUNTY.																	
Branch of Horse Lick, J. T. Ballard's coal bank (cannel coal).	1847	D	4	2.0	43.7	45.5	8.8	3.4	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	44.6	46.5	8.9	3.5	......	......	......	......	......	......	......	......	
Richmond, 17 miles southeast of; Tom Coyle's coal bank (cannel coal).	1846	D	4	2.0	41.0	43.1	13.9	1.1	......	......	......	......	......	......	......	......	Do.
			2	......	41.8	44.0	14.2	1.1	......	......	......	......	......	......	......	......	
JOHNSON COUNTY.																	
Flambeau, southeast of; Flambeau mine, Cannel bed (on chain pillar, 1 main entry, 150 feet southeast of mine mouth).	7133	B	1	2.4	48.4	38.7	10.5	1.2	6.5	72.0	1.2	8.6	1.5	7,650	13,770	......	U. S. Geological Survey, 1913.
			2	......	49.6	39.7	10.7	1.2	6.4	73.7	1.2	6.8	......	7,833	14,100	......	
			3	......	55.5	44.5	......	1.4	7.1	82.6	1.3	7.6	......	8,778	15,800	......	
Same (5 entry, 250 feet southeast of mine mouth).	7132	B	1	2.2	50.6	36.7	10.5	1.0	6.6	72.0	1.2	8.7	1.3	7,639	13,750	......	Do.
			2	......	51.8	37.5	10.7	1.0	6.5	73.6	1.2	7.0	......	7,811	14,060	......	
			3	......	58.0	42.0	......	1.1	7.3	82.5	1.3	7.8	......	8,739	15,730	......	
Lesley (East Point post office); Lesley mine, Lesley bed (cannel coal).	5437	B	1	1.7	50.8	38.2	9.3	1.0	6.8	73.3	1.3	8.3	.4	7,917	14,250	......	Do.
			2	......	51.6	38.9	9.5	1.0	6.8	74.5	1.3	6.9	......	8,056	14,500	......	
			3	......	57.0	43.0	......	1.2	7.5	82.3	1.5	7.5	......	8,894	16,010	......	

Paintsville, 5 miles southeast of; Miller Creek Country bank, Miller Creek bed (1 right entry, 100 feet west of mine mouth).	2405	B	1	7.0	35.0	56.0	2.0	.5	......	......	......	......	4.5	7,606	13,690	......	U. S. Geological Survey, 1906.
			2	......	37.7	60.1	2.2	.5	......	......	......	......	......	8,172	14,710	......	
Same (main entry, 140 feet west of mine mouth).	2406	B	1	6.5	32.4	56.8	2.3	.5	......	......	......	......	4.2	......	......	......	Do.
			2	......	36.8	60.8	2.4	.5	......	......	......	......	......	......	......	......	
Van Lear; Mine No. 1, No. 1 bed (face of 1 right heading, 1 entry).	10548	A	1	7.2	35.2	55.1	2.5	.5	......	......	......	......	4.4	......	......	2,260	Bureau of Mines, 1913.
Same (face of 2 left heading, off west opening).	10549	A	1	5.6	36.4	53.9	4.1	1.7	......	......	......	......	3.0	......	......	2,010	Do.
Same (composite of samples 10548 and 10549).	10550	A	1	6.4	36.2	54.2	3.2	1.2	5.7	74.9	1.5	13.5	3.7	7,478	13,460	......	Do.
			2	......	38.7	57.8	3.5	1.3	5.3	80.1	1.6	8.2	......	7,989	14,380	......	
			3	......	40.1	59.9	......	1.3	5.5	82.9	1.6	8.7	......	8,278	14,900	......	
No. 2 mine (face of 1 right heading, 36-inch cut).	10551	A	1	6.3	36.3	54.1	3.3	1.8	5.7	74.9	1.5	12.8	3.5	7,456	13,420	2,030	Do.
			2	......	38.8	57.7	3.5	1.9	5.4	80.0	1.6	7.6	......	7,961	14,330	......	
			3	......	40.2	59.8	......	2.0	5.6	82.9	1.6	7.9	......	8,256	14,860	......	
No. 3 mine (face of main entry, 39-inch cut).	10552	A	1	6.6	35.3	54.8	3.3	1.4	5.7	74.8	1.4	13.4	4.1	7,428	13,370	2,080	Do.
			2	......	37.8	58.7	3.5	1.5	5.3	80.1	1.5	8.1	......	7,956	14,320	......	
			3	......	30.1	60.9	......	1.6	5.5	83.0	1.5	8.4	......	8,239	14,830	......	
No. 4 mine (face of main entry, 44-inch cut).	10553	A	1	6.9	34.9	55.9	2.3	.6	5.8	76.1	1.5	13.7	4.1	7,483	13,470	2,400	Do.
			2	......	37.5	60.0	2.5	.7	5.4	81.7	1.6	8.1	......	8,039	14,470	......	
			3	......	38.5	61.5	......	.7	5.5	83.8	1.6	8.4	......	8,244	14,840	......	
Meek mine (2 right air course)........	2900	D	4	2.4	37.4	54.8	5.4	.7	......	......	......	......	......	*7,406	13,330	......	Kentucky Geological Survey, 1910.
			2	......	38.4	56.1	5.5	.7	......	......	......	......	......	7,589	13,660	......	
Same (1 eft entry)........................	2896	D	4	2.8	37.5	53.2	6.5	1.0	......	......	......	......	......	*7,350	13,230	......	Do.
			2	......	38.5	54.8	6.7	1.0	......	......	......	......	......	7,565	13,620	......	
Muddy Branch mine (in last break through between 3 and 4 right seams).	3096	D	4	3.1	37.4	55.2	4.3	2.1	......	......	......	......	......	*7,033	12,660	......	Do.
			2	......	38.6	57.0	4.4	2.2	......	......	......	......	......	7,256	13,060	......	
Same (face of 1 left entry).............	3097	D	4	3.4	36.5	57.5	2.6	.8	......	......	......	......	......	*7,478	13,460	......	Do.
			2	......	37.9	59.4	2.7	.8	......	......	......	......	......	7,739	13,930	......	
Rittenhouse mine, No. 1 bed (face of 1 right entry).	2895	D	4	2.9	38.8	54.3	4.0	.7	......	......	......	......	......	*7,467	13,440	......	Do.
			2	......	39.9	56.0	4.1	.7	......	......	......	......	......	7,689	13,840	......	
Same (mouth of 2 right entry)........	2899	D	4	2.5	36.9	52.0	8.6	.7	......	......	......	......	......	*7,133	12,840	......	Do.
			2	......	37.5	52.7	8.8	.7	......	......	......	......	......	7,244	13,040	......	
Sandy River mine (6-room, Bucher entry).	2898	D	4	2.2	32.8	50.1	14.9	.8	......	......	......	......	......	*6,594	11,870	......	Do.
			2	......	33.5	51.3	15.2	.8	......	......	......	......	......	6,739	12,130	......	
Same (cannel coal).......................	2897	D	4	1.5	46.1	42.5	9.9	.8	......	......	......	......	......	*7,217	12,990	......	Do.
			2	......	46.8	42.1	10.1	.8	......	......	......	......	......	7,328	13,190	......	
White House mine, Big Vein.........	2889	D	4	3.0	37.6	49.5	9.9	.8	......	......	......	......	......	*7,022	12,640	......	Do.
			2	......	38.7	51.1	10.2	.9	......	......	......	......	......	7,233	13,020	......	
Same..	2890a	D	4	2.5	32.6	46.9	18.0	.7	......	......	......	......	......	*6,456	11,620	......	Do.
			2	......	33.4	48.2	18.4	.8	......	......	......	......	......	6,623	11,920	......	
Same..	2891b	D	4	3.1	39.2	49.9	7.8	1.0	......	......	......	......	......	*7,233	13,020	......	Do.
			2	......	40.5	51.5	8.0	1.0	......	......	......	......	......	7,467	13,440	......	
Jenny's Creek, head of; Rice's coal....	1850	D	4	3.1	28.6	53.5	4.8	1.7	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	39.8	55.2	5.0	1.8	......	......	......	......	......	......	......	......	
Lick Branch, one-half mile above mouth of White House Creek (cannel coal).	1849	D	4	2.0	38.2	51.0	8.8	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	39.0	52.0	9.0	1.0	......	......	......	......	......	......	......	......	
Paintsville, near; Wheeler's bank.........	1851	D	4	2.7	38.0	56.3	3.0	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	39.1	57.8	3.1	1.3	......	......	......	......	......	......	......	......	

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TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
KNOTT COUNTY.																	
NOTE.—Coals from some of the branches of the North Fork of the Kentucky River.																	
Big Branch, Gough & Co. mine, Haddix bed (face of entry).	2529	D	4	1.7	34.1	53.8	10.4	1.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	34.7	54.7	10.6	1.8	......	......	......	......	......	......	......	......	
Carr Fork, Lots Creek, B. F. Grigsby land, Fire Clay bed (cannel coal).	2540	D	4	.4	44.2	49.4	6.0	.8	......	......	......	......	......	......	......	......	Do.
			2	......	44.4	49.6	6.0	.8	......	......	......	......	......	......	......	......	
Carr Fork, mouth of Little Carr Fork.	2756	D	4	2.9	34.9	54.4	7.8	.7	......	......	......	......	......	*7,011	12,620	......	Do.
			2	......	36.0	55.9	8.1	.7	......	......	......	......	......	7,222	13,000	......	Do.
Pardee; mouth of Dan Fork of Buckhorn Creek, Hazard bed.	2735	D	4	1.8	42.0	49.6	6.6	1.8	......	......	......	......	......	*7,700	13,860	......	Do.
			2	......	42.8	50.5	6.7	1.9	......	......	......	......	......	7,839	14,110	......	Do.
Caney Creek, mouth of; John Deacon's land, Haddix bed.	2616	D	4	3.8	32.3	48.8	15.1	.8	......	......	......	......	......	......	......	......	Do.
			2	......	33.6	50.7	15.7	.9	......	......	......	......	......	......	......	......	Do.
John Little Branch, Gough & Co. mine, Flag bed (cannel coal).	2618	D	4	1.2	53.8	39.5	5.5	.7	......	......	......	......	......	......	......	......	Do.
			2	......	54.5	39.9	5.6	.7	......	......	......	......	......	......	......	......	Do.
Same (bituminous coal)	2612	D	1	7.4	30.2	52.0	10.4	.6	......	......	......	......	......	......	......	......	Do.
			2	......	32.6	56.2	11.2	.7	......	......	......	......	......	......	......	......	Do.
Troublesome Creek, one-half mile above Henderson, Jasper Baker land, Hazard bed.	2755	D	4	1.4	41.7	52.2	4.7	1.1	......	......	......	......	......	*7,961	14,330	......	Do.
			2	......	42.3	53.0	4.7	1.1	......	......	......	......	......	8,078	14,540	......	Do.
Wolf Pen Branch, John Amburgy's opening, Fire Clay bed (cannel coal).	2368	D	4	.3	47.9	44.9	6.9	.8	......	......	......	......	......	......	......	......	Do.
			2	......	48.1	44.9	7.0	.8	......	......	......	......	......	......	......	......	Do.
KNOX COUNTY.																	
Brandel, Bennett No. 1 mine, Dean bed (face of main entry, 2,400 feet from mine mouth).	21537	A	1	4.6	35.9	53.3	6.2	.7	......	......	......	......	2.6	7,406	13,330	2,940	Bureau of Mines, 1918.
Same (face of 4 left entry, 2,000 feet (from mine mouth).	21538	A	1	4.3	36.3	53.6	5.8	.8	......	......	......	......	2.4	7,450	13,410	......	Do.
Same, (face of 5 left entry, 2,500 feet from mine mouth).	21539	A	1	4.2	37.1	53.2	5.5	.8	......	......	......	......	2.3	7,489	13,480	2,960	Do.
Same (face of 2 right entry, 2,000 feet (from mine mouth).	21540	A	1	3.8	37.2	52.3	6.7	.7	......	......	......	......	1.9	7,417	13,350	2,840	Do.
Same (composite of samples 21537 to 21540, inclusive).	21541	A	1	4.2	36.4	53.3	6.1	.8	5.6	74.8	1.7	11.0	2.3	7,450	13,410	......	Do.
			2	......	38.0	55.7	6.3	.8	5.3	78.1	1.8	7.7	......	7,778	14,000	......	Do.
			3	......	40.6	59.4	......	.9	5.7	83.4	1.9	8.1	......	8,300	14,940	......	

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Elys, one-half mile northeast of; New Hughes mine, Jellico bed (face of 5 room, butt entry, 1 mile from mine mouth).	21542	A	1	4.0	34.8	54.8	6.4	1.5	......	......	......	......	2.1	7,439	13,390	2,410	Do.
Same (face of main left entry, 1 mile from mine mouth).	21543	A	1	5.1	36.5	53.0	5.4	1.7	......	......	......	......	3.3	7,417	13,350	2,380	Do.
Same (face of main right entry, 3,000 feet from mine mouth).	21544	A	1	5.0	34.9	52.7	7.4	1.5	......	......	......	......	3.2	7,289	13,120	2,490	Do.
Same (face of 2 left entry, Sandy branch entry, 3,000 feet from mine mouth).	21545	A	1	4.0	34.8	54.0	7.2	1.3	......	......	......	......	2.1	7,350	13,230	2,590	Do.
Same (composite of samples 21542 to 21545, inclusive).	21546	A	1	4.5	35.6	53.2	6.7	1.4	5.5	74.3	1.7	10.4	2.7	7,394	13,310	....	Do.
			2	......	37.3	55.7	7.0	1.5	5.3	77.8	1.8	6.6	......	7,744	13,940	....	
			3	......	40.1	59.9	......	1.6	5.6	83.6	1.9	7.3	......	8,322	14,980	....	
Trosper; Power mine, Dean bed (entry rib, 1 left entry, 2 opening, 600 feet west of mine mouth).	81241	A	1	4.5	36.4	52.6	6.5	.6	......	......	......	......	2.6	7,283	13,110	2,390	Do.
Same (entry, rib, 1 right entry, 2 opening, 600 feet west of mine mouth, rib abandoned).	81242	A	1	5.4	35.1	52.9	6.6	1.0	......	......	......	......	3.3	7,206	12,970	2,740	Do.
Same (room pillar, 1 left entry, 1 opening, 700 feet southwest of mine mouth).	81243	A	1	6.0	36.0	53.0	5.0	.6	......	......	......	......	3.9	7,261	13,070	+2,740	Do.
Same (rib of room, 1 left entry, 1 opening, 1,200 feet east of mine mouth).	81244	A	1	7.3	34.9	51.2	6.6	.7	......	......	......	......	5.2	6,989	12,580	2,620	Do.
Same (composite of samples 81241 to to 81244, inclusive).	81245	A	1	6.9	35.4	51.6	6.1	.7	5.7	72.0	1.6	13.9	5.0	7,100	12,780	....	Do.
			2	......	38.0	55.5	6.5	.8	5.3	77.3	1.8	8.3	......	7,628	13,730	....	
			3	......	40.7	59.3	......	.8	5.6	82.7	1.9	9.0	......	7,161	14,690	....	
LAUREL COUNTY.																	
East Barnstead, 1½ miles northeast of; Bonar mine, No. 1 bed (face of main entry, 2,000 feet from mine mouth).	21429	A	1	4.0	41.4	47.9	6.7	3.8	......	......	......	......	2.2	7,389	13,000	2,090	**Bureau of Mines, 1918.**
Same (face of 3 right entry, 1,800 feet from mine mouth).	21430	A	1	4.7	38.6	52.7	4.0	1.4	......	......	......	......	2.4	7,572	13,630	2,290	Do.
Same (face of 2 right entry, 1,700 feet from mine mouth).	21431	A	1	4.9	38.5	53.9	2.7	1.1	......	......	......	......	2.4	7,656	13,780	2,460	Do.
Same (face of 1 right entry, 1,500 feet from mine mouth).	21432	A	1	4.6	40.4	49.3	5.7	3.0	......	......	......	......	2.6	7,439	13,390	2,020	Do.
Same (composite of samples 21429 to to 21432, inclusive).	21433	A	1	4.5	39.9	50.8	4.8	2.3	5.7	74.6	1.8	10.8	2.4	7,506	13,510	....	Do.
			2	......	41.8	53.2	5.0	2.4	5.4	78.1	1.9	7.2	......	7,861	14,150	....	
			3	......	44.0	56.0	......	2.5	5.7	82.3	2.0	7.5	......	8,278	14,900	....	
Pittsburgh, 1½ miles east of; Acme mine, No. 1 bed (face of 1 left entry, 1,900 feet from mine mouth).	21339	A	1	3.2	41.6	46.2	8.9	4.7	......	......	......	......	1.6	7,261	13,070	2,090	Do.
Same (face of main entry, 2,000 feet from mine mouth)...	21340	A	1	4.0	39.0	49.1	7.9	3.5	......	......	......	......	2.0	7,311	13,160	2,120	Do.
Same (face of 3 right entry, 1,800 feet from mine mouth).	21341	A	1	3.7	39.5	50.7	6.1	3.0	......	......	......	......	1.9	7,467	13,440	2,040	Do.
Same (face of 2 right entry, 1,600 feet from mine mouth).	21342	A	1	4.2	39.3	50.9	5.6	3.0	......	......	......	......	2.0	7,472	13,450	1,990	Do.
Same (composite of samples 21339 to to 21342, inclusive).	21343	A	1	3.8	39.8	49.3	7.1	3.6	5.6	73.1	1.9	8.7	1.9	7,372	13,270	....	Do.
			2	......	41.4	51.2	7.4	3.7	5.4	75.9	1.9	5.7	......	7,667	13,800	....	
			3	......	44.7	55.3	......	4.0	5.8	82.0	2.1	6.1	......	8,278	14,900	....	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
LAWRENCE COUNTY.																	
Brushy Creek, F. Swetman's bank, No. 1 bed.	1589	D	4	5.1	35.3	57.8	1.8	0.7	......	......	......	......	......	......	......	......	Kentucky Geological Survey 1890.
			2	......	37.2	60.9	1.9	.8	......	......	......	......	......	......	......	......	
Same, Holbrook's coal No. 2 bed	1591	D	4	2.1	33.9	56.0	8.0	.7	......	......	......	......	......	......	......	......	Do.
			2	......	34.6	57.2	8.2	.8	......	......	......	......	......	......	......	......	Do.
Cane's Creek, Bogg's Mill near Henderson, No. 1 bed.	1590	D	4	3.3	35.2	47.8	13.7	2.1	......	......	......	......	......	......	......	......	Do.
			2	......	36.4	49.4	14.2	2.2	......	......	......	......	......	......	......	......	
Same, 1 mile from mouth of Bogg's bank, No. 3 bed (upper part of bed).	1592	D	4	2.5	38.6	51.4	7.5	3.8	......	......	......	......	......	......	......	......	Do.
			2	......	39.6	52.7	7.7	3.9	......	......	......	......	......	......	......	......	
Same (lower part of bed)	1593	D	4	2.5	39.0	54.8	3.7	1.1	......	......	......	......	......	......	......	......	Do.
			2	......	40.0	56.2	3.8	1.1	......	......	......	......	......	......	......	......	
Little Laurel Creek (cannel coal)	1861	D	4	1.8	48.2	44.7	5.3	1.1	......	......	......	......	......	......	......	......	Do.
			2	......	49.1	45.5	5.4	1 1	......	......	......	......	......	......	......	......	
Lick Creek, entry on left side going up creek.	2660	D	4	4.8	36.8	49.9	8.5	.7	......	......	......	......	......	*7,011	12,620	......	Kentucky Geological Survey, 1910.
			2	......	38.7	52.3	9.0	.8	......	......	......	......	......	7,361	13,250	......	
Louisa, Crystal Block Coal Co., mine	2997	D	4	3.0	35.2	55.2	6.7	1.0	......	......	......	......	......	*7,222	13,000	......	Do.
			2	......	37.0	55.9	7.1	1.1	......	......	......	......	......	7,594	13,670	......	
6 miles south of; McHenry's coal bank	1588	D	4	4.6	35.7	53.3	6.4	1.1	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.4	55.9	6.7	1.1	......	......	......	......	......	......	......	......	
Peach Orchard Branch, Miller's Branch opening No. 3 bed.	1859	D	4	3.3	34.2	55.3	7.2	.9	......	......	......	......	......	......	......	......	Do.
			2	......	35.4	57.2	7.4	.9	......	......	......	......	......	......	......	......	
LEE COUNTY.																	
Beattyville; three-quarters mile west of; Lower Stufflebean Creek, Pryse's coal (280 yards from entry mouth).	1867	D	4	4.0	35.5	55.5	5.0	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	37.0	57.8	5.2	1.1	......	......	......	......	......	......	......	......	Do.
Two miles below; Mike's Branch, R. B. Jameson's bank (splint coal).	1869	D	4	3.4	32.7	57.6	6.3	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	33.9	59.6	6.5	1.4	......	......	......	......	......	......	......	......	
Mirey Branch, Phillips' bank	1868	D	4	3.1	36.6	57.0	3.3	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	37.8	58.8	3.4	1.1	......	......	......	......	......	......	......	......	
Proctor three-quarters mile above; Daniel Scott's bank.	1865	D	4	2.3	38.1	51.6	8.0	2.4	......	......	......	......	......	......	......	......	Do.
			2	......	39.0	52.8	8.2	2.4	......	......	......	......	......	......	......	......	
Derrickson Creek, near mouth of White Ash mine No. 2 bed.	2821	D	4	1.9	41.2	51.1	5.8	2.4	......	......	......	......	......	*7,294	13,130	......	Kentucky Geological Survey, 1910.
			2	......	42.0	52.1	5.9	2.4	......	......	......	......	......	7,433	13,380	......	
Kentucky River, Block mine	2820	D	4	2.1	40.4	50.9	6.6	2.9	......	......	......	......	......	*7,144	12,860	......	Do.
			2	......	41.3	52.0	6.7	2.9	......	......	......	......	......	7,289	13,120	......	

Sinking Creek, No. 1 bed	2819	D	4	2.7	39.7	48.3	9.3	4.8	......	......	......	......	......	*6,967	12,540	......	Do.
			2	......	40.8	49.6	9.6	4.9	......	......	......	......	......	7,161	12,890	......	
Sturgeon Creek, Stone Coal Branch of, three-eighths mile up branch, Beattyville bed (old opening).	2703	D	1	4.2	39.0	49.2	7.6	2.0	......	......	......	......	......	*7,756	13,960	......	Do.
			2	......	40.7	51.3	8.0	2.1	......	......	......	......	......	8,089	14,560	......	
Duck Fork of, one-fourth mile up, main coal bed.	2704	D	1	3.5	40.5	49.0	7.0	2.6	......	......	......	......	......	*7,478	13,460	......	Do.
			2	......	42.0	50.8	7.2	2.7	......	......	......	......	......	7,750	13,950	......	
LESLIE COUNTY.																	
NOTE.—Analyses of samples from outcrops and prospects along the Middle Fork of the Kentucky River.																	
Old House Branch, Henry Begley land, Hazard bed.	2734	D	4	1.9	38.3	52.4	7.4	.7	......	......	......	......	......	7,561	13,610	......	Do.
			2	......	39.0	53.5	7.5	.8	......	......	......	......	......	7,711	13,880	......	
Cutshin Creek, Laurel Fork of, A. Cornett's land (cannel coal).	2737	D	4	1.6	46.9	45.2	6.3	.7	......	......	......	......	......	7,856	14,140	......	Do.
			2	......	47.7	45.9	6.4	.7	......	......	......	......	......	7,978	14,360	......	
Same (cannel coal)	2738	D	4	1.7	38.8	53.9	5.6	1.3	......	......	......	......	......	7,856	14,140	......	Do.
			2	......	39.4	54.9	5.7	1.4	......	......	......	......	......	7,989	14,380	......	
Asher Branch, Elkhorn bed	2742	D	4	1.8	34.1	57.9	6.2	.6	......	......	......	......	......	......	......	......	Do.
			2	......	34.8	58.9	6.3	.6	......	......	......	......	......	......	......	......	
Burnt Camp Creek, Jesse Morgan land, Fire Clay bed.	2738r	D	4	.7	34.7	55.2	9.4	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	35.3	56.1	9.6	1.0	......	......	......	......	......	......	......	......	
Lewis Creek, 15 miles up Greasy Creek, Fire Clay bed.	2735	D	4	1.7	35.0	57.6	5.7	.6	......	......	......	......	......	......	......	......	Do.
			2	......	35.6	58.6	5.8	.6	......	......	......	......	......	......	......	......	
Beech Fork, Old House Branch of, Silas Nantz land, Hindman bed.	2743	D	4	1.3	32.4	50.3	16.0	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	32.8	51.0	16.2	1.4	......	......	......	......	......	......	......	......	
Ruben Branch of, Elijah Tolliver land, Hindman bed.	2667	D	4	1.6	33.3	49.7	15.4	1.5	......	......	......	......	......	......	......	......	Do.
			2	......	33.8	50.5	15.7	1.5	......	......	......	......	......	......	......	......	
Rush Creek, Bowling's land, Elkhorn bed (upper part of bed).	2785	D	4	1.2	39.6	52.7	6.5	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	40.1	53.3	6.6	1.4	......	......	......	......	......	......	......	......	
LETCHER COUNTY.																	
Flatgap, Va., 1¼ miles south of, local mine, Lower Standiford bed (in entry 15 feet from mine mouth).	15172	A	1	4.1	35.2	55.7	5.0	1.7	......	......	......	......	2.8	7,728	13,910	2,260	Bureau of Mines, 1914.
			2	......	36.7	58.1	5.2	1.8	......	......	......	......	......	8,056	14,500	......	
Three miles southwest of, J. H. Mullin mine, Lower Bolling bed (main entry, 40 feet in entry).	15173	A	1	4.0	31.8	53.0	11.2	1.0	......	......	......	......	2.6	7,139	12,850	2,880	Do.
			2	......	33.1	55.2	11.7	1.0	......	......	......	......	......	7,433	13,380	......	
Fleming, near; Elkhorn 301 mine, Elkhorn bed (face of 4 room, 2 left heading, 1,300 feet from mine mouth).	21308	A	1	2.9	37.3	55.9	3.9	.7	......	......	......	......	1.2	7,814	14,070	2,640	Bureau of Mines, 1918.
Same (face of main right heading, 1,900 feet from mine mouth).	21309	A	1	3.7	36.8	55.6	3.9	.6	......	......	......	......	2.1	7,772	13,990	2,550	Do.
Same (face of 17 room, gap entry, 1,800 feet from mine mouth).	21310	A	1	3.6	36.1	56.3	4.0	.6	......	......	......	......	2.0	7,772	13,990	2,580	Do.
Same (face of gap entry, 1,900 feet from mine mouth).	21311	A	1	4.4	35.6	55.7	4.3	.6	......	......	......	......	2.8	7,672	13,810	2,580	Do.
Same (composite of samples 21308 to 21311, inclusive).	21312	A	1	3.6	36.8	55.5	4.1	.6	5.5	78.8	1.6	9.4	2.0	7,750	13,950	......	Do.
			2	......	38.1	57.7	4.2	.7	5.3	81.8	1.6	6.4	......	8,044	14,480	......	
			3	......	39.8	60.2	......	.7	5.5	85.4	1.7	6.7	......	8,400	15,120	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.[c]	British thermal units.		
LETCHER COUNTY—continued.																	
Fleming, 1 mile west of: Acme mine, Elkhorn bed (16 room neck, 20 feet from face of 3 entry).	29845	A	1	2.9	36.9	57.3	2.9	.7	......	......	......	......	1.2	7,906	14,230	2,300	Bureau of Mines. In print.
Same (15 room, 20 feet from face of 2 entry, 10 feet outby).	29846	A	1	3.1	36.5	57.2	3.2	.6	......	......	......	......	1.5	7,850	14,130	2,390	Do.
Same (composite of samples 29845 and 29846).	92847	A	1	3.0	36.6	57.3	3.1	.7	5.4	79.8	1.5	9.5	1.3	7,889	14,200	....	Do.
			2	......	37.8	59.0	3.2	.7	5.2	82.3	1.6	7.0	......	8,133	14,640	....	
			3	......	39.0	61.0	......	.7	5.4	85.0	1.6	7.3	......	8,406	15,130	....	
Jenkins, Consolidation No. 204 mine, upper Elkhorn bed (face of main heading, 1,700 feet from mine mouth, 7 foot 3½ inch cut).	14904	A	1	3.9	33.8	54.8	7.5	.5	......	......	......	......	1.9	7,461	14,430	2,660	Bureau of Mines, 1914.
			2	......	35.2	57.0	7.8	.5	......	......	......	......	......	7,761	13,970	....	
Same (face of east heading, 1,700 feet from mine mouth, 8-foot cut).	14905	A	1	3.6	35.8	58.0	2.6	.5	5.4	80.1	1.5	10.0	1.7	7,911	14,240	2,490	Do.
			2	......	37.2	60.1	2.7	.5	5.2	83.1	1.6	6.9	......	8,211	14,780	....	
			3	......	38.2	61.8	......	.5	5.3	85.4	1.6	7.2	......	8,439	15,190	....	
McPeak Branch of Elkhorn Creek, Consolidation No. 201 mine, Elkhorn bed (1 west haulage way, 800 feet from mine mouth).	G3716	D	1	1.8	38.3	57.5	2.4	.6	......	......	......	......	.6	8,106	14,590	....	Kentucky Geological Survey, 1916.
			2	......	39.0	58.6	2.4	.6	......	......	......	......	......	8,256	14,860	....	
Same, No. 203 mine (mouth of 1 west entry, main entry, 750 feet from mine mouth).	G3717	D	1	2.4	35.4	59.3	2.9	.6	......	......	......	......	1.2	7,967	14,340	....	Do.
			2	......	36.3	60.7	3.0	.6	......	......	......	......	......	8,167	14,700	....	
One-half mile below mouth of Little Elkhorn Creek, No. 204 mine, Elkhorn bed (face of 15 room, 1 left entry, 1 east entry).	G3718	D	1	2.2	36.4	58.4	3.0	.5	......	......	......	......	1.1	7,978	14,360	....	Do.
			2	......	37.2	59.7	3.1	.6	......	......	......	......	......	8,161	14,690	....	
One-half mile above mouth of Little Elkhorn Creek, No. 205 mine, Elkhorn bed (face of 2 room, 1 left entry, 1 north entry, and south entry, main entry, average of 2 samples).	G3719	D	1	2.7	36.1	58.7	2.5	.6	......	......	......	......	1.1	8,050	14,490	....	Do.
			3	......	37.1	60.3	2.6	.6	......	......	......	......	......	8,272	14,890	....	
Elkhorn Creek, No. 206 mine, Elkhorn bed (2 right entry, 1 north entry, 1,000 feet from mine mouth).	G3723	D	1	2.3	37.2	57.8	2.7	.6	......	......	......	......	.9	8,161	14,690	....	Do.
			2	......	38.0	59.2	2.8	.6	......	......	......	......	......	8,350	15,030	....	

One and three-fourths miles above mouth of Little Elkhorn Creek, No. 207 mine (right of entry, 500 feet from mine mouth).	G3721	D	1	2.6	35.8	56.8	4.8	.6	......	......	......	......	1.2	7,878	14,180	......	Do.
			2	......	36.8	58.3	4.9	.6	......	......	......	......	......	8,083	14,550	......	
Same, No. 208 mine (face of entry)....	G3722	D	1	2.4	36.5	57.5	3.6	.6	......	......	......	......	1.0	7,978	14,360	......	Do.
			2	......	37.4	58.9	3.7	.6	......	......	......	......	......	8,172	14,710	......	
Five miles northeast of; local mine, Lower Elkhorn bed (face of entry, 50 feet from mine mouth, 2 foot ½ inch cut).	14970	A	1	4.8	33.7	57.8	3.7	.8	......	......	......	......	3.1	7,689	13,840	2,520	**Bureau of Mines, 1914.**
			2	......	35.4	60.7	3.9	.9	......	......	......	......	......	8,083	14,550	......	
Same (face of entry, 50 feet from mine mouth, 1-foot cut).	14971	A	1	5.2	28.8	48.1	17.9	.7	......	......	......	......	3.6	6,361	11,450	2,950	Do.
			2	......	30.4	50.7	18.9	.7	......	......	......	......	......	6,711	12,080	......	
Jewel, 3 miles southwest of; Potter bank, Bens Branch of Elkhorn Creek, Upper Elkhorn bed (8-foot cut).	3828	B	1	4.0	32.4	61.0	2.6	.6	......	......	......	......	1.9	......	......	......	**U. S. Geological Survey, 1906.**
			2	......	33.7	63.6	2.7	.6	......	......	......	......	......	......	......	......	
McRoberts, Consolidation No. 213 mine, Elkhorn bed (face of 1 right entry, 1 left face heading).	21294	A	1	3.3	36.8	56.6	3.3	.6	......	......	......	......	1.9	7,833	14,110	2,460	**Bureau of Mines, 1918.**
Same (face of main entry)............	21295	A	1	2.1	37.4	57.5	3.0	.6	......	......	......	......	.7	7,978	14,360	2,350	Do.
Same (face of 1 left entry, 1 right face entry).	21296	A	1	2.9	36.1	57.2	3.8	.5	......	......	......	......	1.3	7,833	14,110	2,670	Do.
Same (face of 1 right face heading)....	21297	A	1	3.4	35.8	57.6	3.2	.5	......	......	......	......	2.0	7,822	14,080	2,500	Do.
Same (composite of samples 21294 to 21297, inclusive).	21298	A	1	2.9	36.3	57.6	3.2	.6	5.7	79.9	1.6	9.2	1.5	7,872	14,170	......	Do.
			2	......	37.4	59.3	3.3	.6	5.5	82.3	1.6	6.7	......	8,106	14,590	......	
			3	......	38.7	61.3	......	.6	5.7	85.1	1.7	6.9	......	8,389	15,100	......	
Consolidation No. 214 mine, Elkhorn bed (face of 2 right heading, 2,900 feet from mine mouth).	21299	A	1	3.1	37.0	57.0	2.9	.5	......	......	......	......	2.1	7,917	14,250	2,520	Do.
Same (face of 1 left entry, 1 right face entry, 2,400 feet from mine mouth).	21300	A	1	3.1	37.1	55.7	4.1	.6	......	......	......	......	1.8	7,806	14,050	2,430	Do.
Same (face of 1 right face heading, 1,900 feet from mine mouth).	21301	A	1	3.4	37.1	55.6	3.9	.6	......	......	......	......	2.1	7,889	14,020	2,730	Do.
Same (face of 2 left entry, 1 left face entry, 2,750 feet from mine mouth).	21317	A	1	3.1	37.0	56.2	3.7	.6	......	......	......	......	1.7	7,856	14,140	2,490	Do.
Same (composite of samples 21299 to 21301, inclusive, and 21317).	21302	A	1	3.2	36.8	56.4	3.6	.6	5.6	79.4	1.6	9.2	1.9	7,828	14,090	......	Do.
			2	......	38.0	58.2	3.8	.6	5.4	82.1	1.6	6.5	......	8,089	14,560	......	
			3	......	39.5	60.5	......	.6	5.6	85.3	1.7	6.8	......	8,400	15,120	......	
She Fork of Wright's Fork, Consolidation No. 210 mine, Elkhorn bed.	G3724	D	1	2.2	35.4	59.4	3.0	.7	......	......	......	......	.8	7,994	14,390	......	**Kentucky Geological Survey, 1916.**
			2	......	36.2	60.7	3.1	.7	......	......	......	......	......	8,178	14,720	......	
Same, Consolidation No. 211 mine (2 left entry, main entry, 500 feet from mine mouth).	G3725	D	1	2.1	35.9	59.2	2.8	.8	......	......	......	......	.6	7,506	13,510	......	Do.
			2	......	36.7	60.5	2.8	.8	......	......	......	......	......	7,667	13,800	......	
Mater; Elkhorn or Kona mine, Elkhorn bed (face of 1 main entry, 750 feet from mine mouth).	21305	A	1	2.7	37.6	55.7	4.0	.9	......	......	......	......	1.0	7,833	14,110	2,510	**Bureau of Mines, 1918.**
Same (face of 1 left entry, 2 main entry, 450 feet from mine mouth).	21303	A	1	3.8	36.5	55.4	4.3	1.0	......	......	......	......	2.5	7,694	13,850	2,480	Do.
Same (face of 2 right entry, 1 main entry, 500 feet from mine mouth).	21304	A	1	3.9	36.7	55.7	3.7	1.0	......	......	......	......	2.6	7,756	13,960	2,390	Do.
Same (face of 2 main entry, 600 feet from mine mouth).	21306	A	1	3.5	37.4	55.0	4.1	1.1	......	......	......	......	2.1	7,756	13,960	2,430	Do.
Same (composite of samples 21303, 21304, and 21306).	21307	A	1	3.8	36.7	55.5	4.0	1.0	5.6	78.0	1.5	9.9	2.4	7,717	13,890	......	Do.
			2	......	38.2	57.6	4.2	1.1	5.4	81.1	1.6	6.6	......	8,022	14,440	......	

Original from PRINCETON UNIVERSITY

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
LETCHER COUNTY—continued.																	
Note.—A few coals from Poor Fork drainage of the Cumberland River.			3		39.9	60.1		1.1	5.7	84.6	1.7	6.9		8,372	15,070		
Poor Fork, Frank's Creek of, Oven Fork of, Imboden coal (outcrop).	G3711	D	1	1.5	34.0	56.1	8.4	1.3					.4	7,900	14,220		Kentucky Geological Survey, 1916.
			2		34.5	57.0	8.5	1.4						8,017	14,430		
Same, Harlan coal (lower part of bed, outcrop).	G3710	D	1	1.4	36.3	57.5	4.8	.9					.4	7,417	13,350		Do.
			2		36.8	58.3	4.9	.9						7,522	13,540		
Near head of Frank's Creek, Taggart coal (outcrop).	G3709	D	1	1.4	36.8	56.4	5.4	.7					.5	7,983	14,370		Do.
			2		37.3	57.2	5.5	.7						8,094	14,570		
Same, High Splint coal (outcrop)	2697	D	4	2.2	35.4	56.2	5.2	.7						*7,611	13,700		Kentucky Geological Survey, 1910.
			2		36.2	57.5	6.3	.7						7,783	14,010		
Stillhouse Branch of Smith Creek of Oven Fork, Limestone coal (outcrop).	2698	D	4	2.9	33.5	54.2	9.4	.8						*7,267	13,080		Do.
			2		34.6	55.7	9.7	.8						7,489	13,480		
Pardee, Va., opening in Virginia, but mine extends into Kentucky, Pardee bed.	G3707	D	1	1.3	36.4	58.0	4.3	.7					.2	8,222	14,800		Kentucky Geological Survey, 1916.
			2		36.9	58.7	4.4	.7						8,328	14,990		
Same	G3708	D	1	1.3	35.6	56.7	6.4	1.1					.3	7,839	14,110		Do.
			2		36.0	58.6	6.4	1.2						7,939	14,290		
NOTE.—A few coals from the North Fork of the Kentucky River and its branches.																	
North Fork:																	
Line Fork, Turkey Creek of, Fire Clay bed (outcrop).	G3735	D	1	2.2	37.3	56.0	4.5	.9					.6	7,561	13,610		Do.
			2		38.1	57.3	4.6	.9						7,728	13,910		
Ingram Creek of, Cornett bank (cannel coal).	G3731	D	1	1.1	37.8	57.3	3.8	.6					.3	7,106	12,790		Do.
			2		38.2	58.0	3.8	.6						7,189	12,940		
Big Branch of, Williard Creek, Hazard bed (muddy outcrop).	2794	D	4	4.0	32.8	52.8	10.4	.7									Kentucky Geological Survey, 1910.
			2		34.2	55.0	10.8	.8									
Cornett Branch of (outcrop)	2736	D	4	1.0	34.0	39.1	25.9	.5						*6,283	11,310		Do.
			2		34.4	39.5	26.1	.6						6,350	11,430		
Same, Haddix coal (outcrop)	G3732	D	1	2.1	37.6	53.8	6.5	1.1					.6	7,217	12,990		Kentucky Geological Survey, 1916.
			2		38.4	55.0	6.6	1.1						7,372	13,270		
Holcomb Branch of, Fire Clay coal (outcrop).	G3733	D	1	2.1	39.3	54.5	4.1	.9					.5	7,500	13,500		Do.
			2		40.1	55.8	4.1	.9						7,656	13,780		
Shipley Fork of Trace Fork of, Flag coal (outcrop).	G3734	D	1	2.3	37.8	55.4	4.5	.7					.7	7,517	13,530		Do.
			2		38.7	56.7	4.6	.7						7,689	13,840		

Elk Creek of, Hazard coal (outcrop)	G3699	D		1	2.7	34.0	57.2	6.1	.7	......	......	......	......	1.4	7,600	13,680	......	Do.
				2	......	35.0	58.7	6.3	.7	......	......	......	......	......	7,811	14,060	......	
Same, Flag coal (outcrop)	G3698	D		1	2.6	37.6	54.4	5.4	.7	......	......	......	......	1.3	7,683	13,830	......	Do.
				2	......	39.0	55.4	5.6	.8	......	......	......	......	......	7,972	14,350	......	
Rockhouse Creek of, right fork of Doty Branch, Flag coal (outcrop).	G3700	D		1	2.7	34.6	58.2	4.5	.5	......	......	......	......	1.5	7,794	14,030	......	Do.
				2	......	35.6	59.8	4.6	.6	......	......	......	......	......	8,011	14,420	......	
Elkhorn Branch of, Amburgy coal (outcrop).	G3701	D		1	1.6	41.7	49.5	7.2	2.7	......	......	......	......	.7	7,706	13,870	......	Do.
				2	......	42.3	50.4	7.3	2.7	......	......	......	......	......	7,828	14,090	......	
Daniels Branch of, Fire Clay coal (outcrop).	G3702	D		1	2.4	38.0	56.3	3.3	.8	......	......	......	......	.9	7,961	14,330	......	Do.
				2	......	38.9	57.7	3.4	.8	......	......	......	......	......	8,156	14,680	......	
Daniels Branch, head of, Hindman coal (outcrop).	G3703	D		1	2.9	36.9	53.2	7.0	.7	......	......	......	......	1.1	7,528	13,550	......	Do.
				2	......	38.0	54.8	7.2	.7	......	......	......	......	......	7,756	13,960	......	
Camp Branch of, Elkhorn coal (outcrop).	G3706	D		1	1.4	39.4	54.4	4.8	1.7	......	......	......	......	.4	8,139	14,650	......	Do.
				2	......	39.9	55.3	4.8	1.7	......	......	......	......	......	8,250	14,850	......	
Same, head of, Whitesburg coal (outcrop).	G3696	D		1	3.6	35.3	55.1	6.0	.8	......	......	......	......	2.0	7,478	13,460	......	Do.
				2	......	36.6	57.2	6.2	.8	......	......	......	......	......	7,761	13,970	......	
Same, head of, Fire Clay coal (outcrop).	G3697	D		1	2.6	37.6	54.8	5.0	.7	......	......	......	......	1.3	7,700	13,860	......	Do.
				2	......	38.7	56.1	5.2	.8	......	......	......	......	......	7,906	14,230	......	
Kings Creek of, Fields land (cannel coal)	2353	D		4	1.1	34.3	58.1	6.5	.9	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
				2	......	34.7	58.7	6.6	.9	......	......	......	......	......	......	......	......	
Smoot Creek of, ½ mile up creek, Amburgy coal (outcrop).	G3712	D		1	2.2	33.8	55.8	8.2	1.0	......	......	......	......	.7	7,444	13,400	......	Kentucky Geological Survey, 1916.
				2	......	34.5	57.1	8.4	1.0	......	......	......	......	......	7,611	13,700	......	
Beetree Branch of, Fire Clay coal (upper portion of bed).	G3714	D		1	2.3	34.7	55.8	7.2	.9	......	......	......	......	.9	7,611	13,700	......	Do.
				2	......	35.5	57.1	7.4	.9	......	......	......	......	......	7,789	14,020	......	
Same (lower part of bed)	G3713	D		1	2.0	35.2	57.6	5.2	.7	......	......	......	......	.7	7,733	13,920	......	Do.
				2	......	36.0	58.7	5.3	.7	......	......	......	......	......	7,894	14,210	......	
Kingdom-Come Creek, William Isom's land, Hamlin coal (outcrop).	G3736	D		1	2.1	37.2	55.4	5.3	.9	......	......	......	......	.6	7,467	13,440	......	Do.
				2	......	38.0	56.6	5.4	.9	......	......	......	......	......	7,622	13,720	......	
Sand Lick Creek, 1½ miles below Whitesburg, Caudell's bank, Rockhouse coal (outcrop).	2358	D		4	1.3	39.6	55.2	3.9	2.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
				2	......	40.1	55.9	4.0	2.9	......	......	......	......	......	......	......	......	
Millstone Creek, Right Fork of, Melvin Tolliver land (outcrop).	2753	D		4	1.4	37.0	53.4	8.2	.7	......	......	......	......	......	*7,722	13,900	......	Do.
				2	......	37.5	54.2	8.3	.7	......	......	......	......	......	7,833	14,100	......	
Same, John Lexton land (outcrop)	2754	D		4	.4	46.1	40.5	13.0	2.0	......	......	......	......	......	*7,722	13,900	......	Do.
				2	......	46.3	40.6	13.1	2.0	......	......	......	......	......	7,749	13,950	......	
Potter Fork of, No. 303 mine, Elkhorn bed (face of entry, 500 feet from mine mouth).	G3727	D		1	2.5	36.5	58.1	2.9	.7	......	......	......	......	1.1	7,706	13,870	......	Kentucky Geological Survey, 1916.
				2	......	37.4	59.7	2.9	.7	......	......	......	......	......	7,906	14,230	......	
Same, No. 304 mine (face of entry, 1,200 feet from mine mouth).	G3728	D		1	2.6	35.5	59.2	2.7	.7	......	......	......	......	1.1	7,644	13,760	......	Do.
				2	......	36.4	60.9	2.7	.7	......	......	......	......	......	7,850	14,130	......	
Wrights Fork, Bottom Fork of, No. 302 mine, Elkhorn bed.	G3726	D		1	2.3	36.3	58.5	2.9	.8	......	......	......	......	.8	7,928	14,270	......	Do.
				2	......	37.2	59.8	3.0	.8	......	......	......	......	......	8,111	14,600	......	
Seco, Boone Fork, 1 mile above Kona, No. 1 mine, Elkhorn bed.	G3729	D		1	2.1	37.8	57.0	3.1	1.7	......	......	......	......	.9	7,611	13,700	......	Do.
				2	......	38.7	58.1	3.2	1.7	......	......	......	......	......	7,778	14,000	......	
Big Sandy River, Elkhorn Creek, Shelby Gap Creek of, Panther Branch of, Shelby Gap coal.	G3720	D		1	2.1	36.1	57.6	4.2	.7	......	......	......	......	.6	7,661	13,790	......	Do.
				2	......	36.9	58.8	4.3	.7	......	......	......	......	......	7,822	14,080	......	
Pine Creek of, Panther Branch of, at Penny Station, Penny coal (outcrop).	G3730	D		1	1.9	38.7	57.3	2.1	.9	......	......	......	......	.3	7,761	13,970	......	Do.
				2	......	39.5	58.4	2.1	.9	......	......	......	......	......	7,917	14,250	......	

Original from PRINCETON UNIVERSITY

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
MADISON COUNTY.																	
Cox's coal bank, top of Big Hill	1877	D	4	2.7	33.7	56.1	7.5	.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	34.6	54.7	7.7	.8	......	......	......	......	......	......	......	......	
M. Moran's mine, top of Big Hill, beside the road.	1878	D	4	1.9	45.8	44.8	7.5	2.9	......	......	......	......	......	......	......	......	Do.
			2	......	46.7	45.7	7.6	3.0	......	......	......	......	......	......	......	......	
Same	2058	D	4	3.6	36.5	55.8	4.1	.8	......	......	......	......	......	......	......	......	Do.
			2	......	37.9	57.8	4.3	.8	......	......	......	......	......	......	......	......	
MAGOFFIN COUNTY.																	
Amos Davis bank, on Licking River	1880	D	4	4.3	37.4	53.1	5.2	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	39.1	55.5	5.4	1.4	......	......	......	......	......	......	......	......	
Colvins Cannel coal (main outcrop)	1882	D	4	2.3	51.9	37.6	8.2	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	53.1	38.5	8.4	1.5	......	......	......	......	......	......	......	......	
Near mouth of Johnsons Creek, Stacey coal bank.	1881	D	4	3.7	36.6	54.7	5.0	.9	......	......	......	......	......	......	......	......	Do.
			2	......	38.1	56.7	5.2	1.0	......	......	......	......	......	......	......	......	
Bullmire Branch, Bird Howard land (outcrop).	G 3799	D	1	3.6	34.3	51.8	10.3	1.4	......	......	......	......	1.3	7,067	12,720	......	Kentucky Geological Survey, 1919.
			2	......	35.6	53.7	10.7	1.5	......	......	......	......	......	7,328	13,190	......	
Burning Fork, opposite Kelly Branch; T. J. Riceland, Whitesburg coal.	G 3795	D	1	4.6	34.7	53.8	6.9	2.2	......	......	......	......	1.6	7,550	13,590	......	Do.
			2	......	36.4	56.4	7.2	2.3	......	......	......	......	......	7,917	14,250	......	
Falcom post office; Smith Adam's land, Whitesburg coal (upper part of bed).	G 3787	D	1	4.3	35.6	51.1	9.0	1.5	......	......	......	......	1.4	7,233	13,020	......	Do.
			2	......	37.2	53.4	9.4	1.9	......	......	......	......	......	7,556	13,600	......	
Same (lower part of bed)	G 3788	D	1	5.8	36.4	53.0	4.8	.9	......	......	......	......	2.5	7,528	13,550	......	Do.
			2	......	38.6	56.3	5.1	.9	......	......	......	......	......	7,989	14,380	......	
Gapville post office; head of Puncheon Creek, Fugate coal.	G 3798	D	1	6.2	23.2	63.4	7.2	.9	......	......	......	......	4.1	7,450	13,410	......	Do.
			2	......	24.7	67.7	7.6	.9	......	......	......	......	......	7,939	14,290	......	
Grape Creek, 1 left branch of, Haddix coal.	G 3794	D	1	4.7	38.5	51.0	5.8	1.3	......	......	......	......	1.7	7,728	13,910	......	Do.
			2	......	40.4	53.5	6.1	1.3	......	......	......	......	......	8,106	14,590	......	
Hendricks post office; 1½ miles above; left fork of Middle Fork, Larkin Arnett land, Gun Creek coal.	G 3796	D	1	5.0	35.4	49.0	10.6	3.1	......	......	......	......	2.4	7,067	12,720	......	Do.
			2	......	37.2	51.6	11.2	3.2	......	......	......	......	......	7,439	13,390	......	
Johnson Creek, at county line on State road fork of; William Patrick land, Young coal.	G 3793	D	1	4.3	36.4	49.9	9.4	2.9	......	......	......	......	2.0	7,475	13,450	......	Do.
			2	......	38.1	52.0	9.9	3.0	......	......	......	......	......	7,811	14,060	......	
Lacey Creek, Jane Estep land, Lacey Creek coal.	G 3789	D	1	4.3	36.6	53.9	5.2	1.2	......	......	......	......	1.5	7,600	13,680	......	Do.
			2	......	38.3	56.2	5.5	1.3	......	......	......	......	......	7,922	14,260	......	

Lykins post office, one-half mile above; White Oak Creek, Mart Conley land, Hazard coal (cannel).	G 3792	D	1	1.8	47.8	36.0	14.4	3.2	......	......	......	......	.3	7,756	13,960	......	Do.
			2	......	48.7	36.7	14.6	3.2	......	......	......	......	......	7,900	14,220	......	
Same, 1 mile above county line, Fire Clay coal.	G 3791	D	1	3.3	40.2	48.3	8.2	2.9	......	......	......	......	.9	7,922	14,260	......	Do.
			2	......	41.6	49.9	8.5	3.0	......	......	......	......	......	8,189	14,740	......	
Bull Creek above Lick Fork, Dan Wireman land, Whittaker coal.	G 3800	D	1	5.0	31.7	54.7	8.6	.8	......	......	......	......	2.4	7,244	13,040	......	Do.
			2	......	33.4	57.6	9.0	.9	......	......	......	......	......	7,617	13,710	......	
Head of Lick Fork of Middle Creek, Tom Cooper coal.	G 3801	D	1	5.7	28.2	62.2	3.9	.8	......	......	......	......	3.1	7,606	13,690	......	Do.
			2	......	29.9	66.0	4.1	.8	......	......	......	......	......	8,067	14,520	......	
Head of Oakley Creek, Joe Watson land, Hazard coal.	G 3797	D	1	6.7	28.9	56.2	8.2	.8	......	......	......	......	......	7,133	12,840	......	Do.
			2	......	30.9	60.3	8.8	.9	......	......	......	......	......	7,644	13,760	......	
Rockhouse Creek, right fork of, Ben Montgomery land, Haddix coal.	G 3790	D	1	4.5	38.8	48.0	8.7	2.8	......	......	......	......	1.7	7,517	13,530	......	Do.
			2	......	40.7	50.1	9.2	2.9	......	......	......	......	......	7,867	14,160	......	
Raccoon Branch of Salt Lick Creek, Fire Clay coal (above parting).	G 3802	D	1	3.4	33.8	55.0	7.8	1.6	......	......	......	......	1.2	7,578	13,640	......	Do.
			2	......	35.0	56.9	8.1	1.7	......	......	......	......	......	7,850	14,130	......	
Same (below parting)................	G 3803	D	1	4.4	34.5	52.8	8.3	1.3	......	......	......	......	1.0	7,183	12,930	......	Do.
			2	......	36.2	55.1	8.7	1.3	......	......	......	......	......	7,511	13,520	......	
Big Run Branch of Trace Fork, Noel Wireman land, Whittaker coal.	G 3804	D	1	3.5	31.2	55.6	9.7	.8	......	......	......	......	1.3	7,328	13,190	......	Do.
			2	......	32.3	57.7	10.0	.8	......	......	......	......	......	7,589	13,660	......	
Mimicks Fork of left fork of Trace Fork, Lenville Rowe's land, Flag coal.	G 3805	D	1	7.0	31.1	50.9	11.0	.9	......	......	......	......	3.5	6,756	12,160	......	Do.
			2	......	33.5	54.6	11.9	1.1	......	......	......	......	......	7,256	13,060	......	
Salyer's Branch, R. C. Salyer land, Fire Clay coal.	G 3806	D	1	4.1	33.1	47.1	15.7	2.6	......	......	......	......	1.6	6,783	12,210	......	Do.
			2	......	34.5	49.2	16.3	2.7	......	......	......	......	......	7,072	12,730	......	
MARTIN COUNTY.																	
Warfield; mouth of Collins Creek, No. 1 coal (entry near salt works).	1883	D	4	2.2	33.6	55.0	9.2	2.6	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	34.3	56.3	9.4	2.6	......	......	......	......	......	......	......	......	
On Tug Fork (opening in face of hill).	1884	D	4	2.5	33.7	52.6	11.2	.8	......	......	......	......	......	......	......	......	Do.
			2	......	34.6	53.9	11.5	.8	......	......	......	......	......	......	......	......	
"Warfield splint coal"................	1885	D	4	2.2	33.1	52.7	12.0	.6	......	......	......	......	......	......	......	......	Do.
			2	......	33.8	53.9	12.3	.6	......	......	......	......	......	......	......	......	
Head of Laurel Fork of Nats Creek, "8-foot coal" (old opening).	1886	D	4	3.5	31.9	52.1	12.5	.9	......	......	......	......	......	......	......	......	Do.
			2	......	33.1	53.9	13.0	.9	......	......	......	......	......	......	......	......	
Copperas Gap, head of Middle Fork, Rockcastle Creek, E. coal.	2658	D	4	3.2	38.6	51.2	7.0	.8	......	......	......	......	......	*6,767	12,180	......	Kentucky Geological Survey, 1910.
			2	......	39.9	52.9	7.2	.9	......	......	......	......	......	6,983	12,570	......	
Pigeon Roost Branch, Laurel Fork of Middle Fork, Rockcastle Creek, E. coal.	2659	D	4	3.1	36.8	46.5	13.6	.7	......	......	......	......	......	*6,783	12,210	......	Do.
			2	......	38.0	48.0	14.0	.7	......	......	......	......	......	6,994	12,590	......	
M'CREARY COUNTY.																	
Shoopman; Fidelity mine, No. 1 or Hudson bed (face of 2 west main entry, 1,300 feet west of mine mouth).	82631	A	1	3.3	37.5	50.5	8.7	1.9	......	......	......	......	1.3	7,233	13,020	2,510	Bureau of Mines.
Same (face of 4 south entry, 2,100 feet south, 45° west of mine mouth).	82632	A	1	3.1	37.0	50.0	9.9	3.4	......	......	......	......	1.2	7,150	12,870	2,150	Do.
Same (face of 23 room, off air course, 1 south entry, 2,300 feet south of mine mouth).	82633	A	1	3.8	37.8	51.7	6.7	2.2	......	......	......	......	1.4	7,411	13,340	2,240	Do.
Same (face of 5 south entry, 1,300 feet south, 45° east of mine mouth).	82634	A	1	3.8	37.6	51.6	7.0	2.5	......	......	......	......	1.5	7,356	13,240	2,350	Do.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
M'CREARY COUNTY—continued.																	
Shoopman; Fidelity mine, No. 1 or Hudson bed, (face of main north entry, 1,400 feet north of mine mouth).	82635	A	1	3.7	36.8	53.2	6.3	2.0	......	......	......	......	1.4	7,433	13,380	2,310	Bureau of Mines
Same (face of 2 north entry, 1,300 feet north, 15° west of mine mouth).	82636	A	1	3.8	35.5	54.0	6.7	2.0	......	......	......	......	1.5	7,389	13,300	2,510	Do.
Same (composite of samples 82631 to 82636, inclusive).	82637	A	1	3.5	37.4	51.6	7.5	2.3	5.4	73.1	1.3	10.4	1.4	7,328	13,190	....	Do.
			2	......	38.8	53.4	7.8	2.4	5.2	75.8	1.3	7.5	......	7,594	13,670	....	
			3	......	42.1	57.9	......	2.6	5.7	82.2	1.4	8.1	......	8,240	14,830	....	
Worley; Worley or No. 4 mine, No. 1½ bed (rib at face 3 right crosscut, 2 west entry, 1,300 feet northwest of mine mouth).	82643	A	1	.3	35.0	55.3	5.4	.6	......	......	......	......	1.8	7,440	13,390	2,740	Do.
Same (face of 2 room, 1 left crosscut, 7 entry, 1,600 feet southwest of mine mouth).	82644	A	1	3.7	38.2	54.6	3.5	.7	......	......	......	......	1.5	7,728	13,910	2,480	Do.
Same (face of last crosscut, slope, 16 left entry, 1 east main entry, 5,800 feet northeast of mine mouth).	82645	A	1	4.1	35.3	55.9	4.7	.5	......	......	......	......	1.9	7,522	13,540	2,740	Do.
Same (face of 17 right entry, east main entry, 5,400 feet southeast of mine mouth).	82646	A	1	4.3	36.7	54.6	4.4	.6	......	......	......	......	1.8	7,567	13,620	+2,740	Do.
Same (on chain stump, 14 right entry, 4,000 feet east of mine mouth).	82647	A	1	4.4	35.4	55.6	4.6	.6	......	......	......	......	2.0	7,500	13,500	2,450	Do.
Same (composite of samples 82643 to 82647, inclusive).	82648	A	1	4.2	36.2	55.1	4.5	.7	5.6	76.0	1.4	11.8	1.8	7,545	13,580	....	Do.
			2	......	37.8	57.5	4.7	.7	5.3	79.3	1.5	8.5	......	7,873	14,170	....	
			3	......	39.6	60.4	......	.7	5.6	83.3	1.6	8.8	......	8,261	14,870	....	
MENIFEE COUNTY.																	
Harkins Creek, near county line, subconglomerate.	1601	D	4	2.9	33.1	56.6	7.4	1.0	......	......	......	......	......	......	......	....	Kentucky Geological Survey, 1890.
			2	......	34.1	58.3	7.6	1.0	......	......	......	......	......	......	......	....	
Mouth of Glady Creek, Ledford's land, subconglomerate.	1602	D	4	2.7	34.0	50.2	13.1	4.1	......	......	......	......	......	......	......	....	Do.
			2	......	35.0	51.6	13.4	4.2	......	......	......	......	......	......	......	....	
Frenchburg, Old Slate Branch; Adams's bank.	1896b	D	4	5.0	32.4	58.4	4.2	.6	......	......	......	......	......	......	......	....	Do.
			2	......	34.1	61.5	4.4	.6	......	......	......	......	......	......	......	....	

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Mouth of Brushy Fork of Beaver Creek; Steele's bank.	1896d	D		4	3.8	38.6	52.0	5.6	2.1	......	......	......	......	......	......	......	......	Do.
				2	......	40.1	54.1	5.8	2.2	......	......	......	......	......	......	......	......	
Amet Fork of Indian Creek, Red River Valley R. R. mine.	2825	D		4	3.0	43.3	47.9	5.8	1.5	......	......	......	......	......	*7,150	12,870	......	Kentucky Geological Survey, 1910.
				2	......	44.6	49.4	6.0	1.6	......	......	......	......	......	7,367	13,260	......	
MORGAN COUNTY.																		
North Fork of Licking River, May Oakley Branch; H. M. Collins mine (cannel coal).	3074	D		4	1.6	49.7	31.7	17.0	1.9	......	......	......	......	......	*6,189	11,140	......	Kentucky Geological Survey, 1910.
				2	......	50.5	32.2	17.3	1.9	......	......	......	......	......	6,289	11,320	......	
Wrigley; North Fork Cannel Coal mine, No. 1 coal.	3062	D		4	1.3	52.7	32.7	13.3	1.6	......	......	......	......	......	*6,961	12,530	......	Do.
				2	......	53.4	33.1	13.5	1.6	......	......	......	......	......	7,056	12,700	......	
Same, No. 2 coal	3063	D		4	1.0	42.1	27.9	29.0	2.7	......	......	......	......	......	*6,272	11,290	......	Do.
				2	......	42.6	28.1	29.3	2.8	......	......	......	......	......	6,339	11,410	......	
Same, No. 3 coal	3064	D		4	1.0	53.3	33.4	12.0	1.7	......	......	......	......	......	*7,256	13,060	......	Do.
				2	......	54.0	33.9	12.1	1.7	......	......	......	......	......	7,350	13,230	......	
Same, No. 4 coal	3065	D		4	1.1	44.5	30.6	23.8	1.3	......	......	......	......	......	*6,267	11,280	......	Do.
				2	......	45.0	30.9	24.1	1.3	......	......	......	......	......	6,339	11,410	......	
Three miles from, at Redwine, Lee mine No. 1 (top coal).	3164	D		4	1.5	45.3	28.4	24.8	1.6	......	......	......	......	......	*6,694	12,050	......	Do.
				2	......	45.9	28.9	25.2	1.6	......	......	......	......	......	6,789	12,220	......	
Same (bottom coal)	3165	D		4	1.7	51.8	33.2	13.3	1.8	......	......	......	......	......	*7,311	13,160	......	Do.
				2	......	52.7	33.8	13.5	1.8	......	......	......	......	......	7,433	13,380	......	
Same (average of top and bottom)	3166	D		4	1.4	50.2	32.2	16.2	1.5	......	......	......	......	......	*7,006	12,610	......	Do.
				2	......	50.9	32.6	16.5	1.5	......	......	......	......	......	7,100	12,780	......	
"Pierat's cannel coal"	1890	D		4	2.1	49.6	43.2	5.1	1.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
				2	......	50.7	44.1	5.2	1.0	......	......	......	......	......	......	......	......	
Elk Fork of Licking River, Maynhier's bank (cannel coal).	1891	D		4	2.3	41.6	44.7	11.4	1.3	......	......	......	......	......	......	......	......	Do.
				2	......	42.6	45.7	11.7	1.3	......	......	......	......	......	......	......	......	
West Liberty, near (6-foot coal)	1892	D		4	4.3	35.2	50.1	10.4	1.0	......	......	......	......	......	......	......	......	Do.
				2	......	36.8	52.3	10.9	1.1	......	......	......	......	......	......	......	......	
OWSLEY COUNTY.																		
Booneville, 1 mile from; Gabbard Fork, D. H. Reynolds's bank.	2818	D		4	2.0	36.8	53.7	7.5	1.1	......	......	......	......	......	*7,456	13,420	......	Kentucky Geological Survey, 1910.
				2	......	37.6	54.8	7.6	1.1	......	......	......	......	......	7,606	13,690	......	
Four miles above; South Fork of Kentucky River; Steffee and Samuel mines.	1936	D		4	2.1	35.2	58.7	4.0	1.4	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
				2	......	36.0	59.9	4.1	1.5	......	......	......	......	......	......	......	......	
Same (cannel coal)	1937	D		4	.5	59.7	32.3	7.5	......	......	......	......	......	......	......	......	......	Do.
				2	......	60.0	32.5	7.5	......	......	......	......	......	......	......	......	......	
PERRY COUNTY.																		
Domino; Himyar mine, Haddix, Hazard, or No. 6 bed (face of 2 left entry, 800 feet from mine mouth).	21334	A		1	6.1	35.0	53.0	5.9	.6	......	......	......	......	3.6	7,256	13,060	2,560	Bureau of Mines, 1918.
Same (face of 1 right entry, 500 feet from mine mouth).	21335	A		1	4.9	34.2	51.4	9.5	.6	......	......	......	......	2.8	7,028	12,650	2,020	Do.
Same (face of 1 left entry, 2 main entry, 550 feet from mine mouth).	21336	A		1	5.0	35.1	52.0	7.9	.7	......	......	......	......	2.8	7,156	12,880	3,010	Do.
Same (face of 2 main entry, 700 feet from mine mouth).	21337	A		1	5.5	34.6	50.7	9.2	1.2	......	......	......	......	3.2	6,983	12,570	2,250	Do.
Same (composite of samples 21334 to 21337, inclusive).	21338	A		1	5.3	34.9	51.7	8.1	.7	5.4	72.5	1.6	11.7	3.1	7,117	12,810	......	Do.
				2	......	36.8	54.7	8.5	.8	5.0	76.6	1.6	7.5	......	7,517	13,530	......	
				3	......	40.3	59.7	......	.9	5.5	83.7	1.8	8.1	......	8,217	14,790	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
PERRY COUNTY—continued.																	
Douglas; Douglas mine, Fire Clay, Dean, or No. 4 bed (face of 4 room, 2 right entry. 500 feet from mine mouth).	21354	A	1	3.8	36.2	56.0	4.0	.7	......	......	......	......	1.9	7,689	13,840	2,840	Bureau of Mines, 1918.
Same (face of 2 right entry, 600 feet from mine mouth).	21355	A	1	3.6	37.8	55.5	3.1	.9	......	......	......	......	1.7	7,794	14,030	2,620	Do.
Same (face of 3 right entry)..........	21356	A	1	3.3	37.8	56.1	2.8	.7	......	......	......	......	1.3	7,833	14,100	2,970	Do.
Same (face of 1 right entry, 800 feet from mine mouth).	21357	A	1	3.8	37.1	55.4	3.7	.7	......	......	......	......	1.9	7,722	13,900	+3,010	Do.
Same (composite of samples 21354 to 21357, inclusive).	21358	A	1	3.6	37.1	55.9	3.4	.7	5.6	78.8	1.7	9.8	1.7	7,767	13,980	....	Do.
			2	......	38.5	58.0	3.5	.7	5.4	81.7	1.8	6.9	......	8,061	14,510	....	
			3	......	39.9	60.1	......	.8	5.6	84.7	1.8	7.1	......	8,350	15,030	....	
Hazard; one-half mile east of; Hazard mine, Fire Clay bed (face of 3 west entry, 1,800 feet southwest of mine mouth).	21364	A	1	3.7	37.3	55.9	3.1	.7	......	......	......	......	1.9	7,756	13,960	2,910	Do.
Same (face of 1 west entry, 1,200 feet southwest of mine mouth).	21365	A	1	3.5	37.5	55.1	3.9	.6	......	......	......	......	1.5	7,722	13,900	2,910	Do.
Same (face of 2 right entry, 1,800 feet from mine mouth).	21366	A	1	3.8	36.8	55.8	3.6	.6	......	......	......	......	1.8	7,706	13,870	+3,010	Do.
Same (composite of samples 21364 to 21366, inclusive).	21367	A	1	3.8	36.9	55.8	3.5	.7	5.6	77.8	1.8	10.6	1.7	7,733	13,920	....	Do.
			2	......	38.4	57.9	3.7	.7	5.3	80.8	1.8	7.7	......	8,039	14,470	....	
			3	......	39.8	60.2	......	.7	5.5	83.9	1.9	8.0	......	8,344	15,020	....	
One-half mile southwest of; Hazard-Dean mine, Fire Clay, Dean, or No. 4 bed (face of 1 main entry, 900 feet from mine mouth).	21368	A	1	4.5	36.2	55.1	4.2	.9	......	......	......	......	2.3	7,572	13,630	2,370	Do.
Same (face of 2 main entry, 500 feet from mine mouth).	21369	A	1	3.6	37.9	54.8	3.7	.8	......	......	......	......	1.6	7,706	13,870	2,490	Do.
Same (face of 2 right entry, 900 feet from mine mouth).	21370	A	1	3.7	37.0	55.2	4.1	.6	......	......	......	......	1.7	7,656	13,780	....	Do.
Same (face of 2 left entry, 950 feet from mine mouth).	21371	A	1	3.9	37.6	54.9	3.6	.7	......	......	......	......	1.8	7,689	13,840	....	Do.
Same (composite of samples 21368 to 21371, inclusive).	21372	A	1	3.9	37.0	55.2	3.9	.7	5.5	77.1	1.6	11.2	1.8	7,656	13,780	....	Do.
			2	......	38.5	57.4	4.1	.8	5.3	80.2	1.7	7.9	......	7,967	14,340	....	
			3	......	40.1	59.9	......	.8	5.5	83.6	1.8	8.3	......	8,306	14,950	....	

One mile south of; Ross-Petrey mine, Fire Clay, Dean, or No. 4 bed (face of 2 drift entry, main entry, 500 feet from mine mouth).	21686	A	1 2 3	4.1	36.0 37.5 40.0	54.0 56.3 60.0	5.9 6.2	.7 .7 .7	....	....	....	....	1.8	7,461 7,778 8,289	13,430 14,000 14,920	3,010	Do.
Lennut; North Fork mine, Fire Clay, Dean, or No. 4 bed (face of 1 left entry, 700 feet from mine mouth).	21359	A	1	3.4	37.3	55.0	4.3	1.1	......	......	......	......	1.2	7,661	13,790	2,630	Do.
Same (face of main entry, 900 feet from mine mouth).	21360	A	1	4.2	38.2	53.7	3.9	.8	......	......	......	......	2.1	7,622	13,720	3,010	Do.
Same (face of 15 room, left entry, 2 main entry, 700 feet from mine mouth).	21361	A	1	3.9	37.0	54.8	4.3	.8	......	......	......	......	1.7	7,611	13,700	2,960	Do.
Same (face of 18 room, 2 left entry, 750 feet from mine mouth).	21362	A	1	4.3	37.2	54.7	3.8	.7	......	......	......	......	2.1	7,639	13,750	3,010	Do.
Same (composite of samples 21359 to 21362, inclusive).	21363	A	1 2 3	3.9	37.3 38.8 40.5	54.7 57.0 59.5	4.1 4.2	.8 .9 .9	5.6 5.3 5.6	76.8 79.9 83.4	1.7 1.8 1.9	11.0 7.9 8.2	1.8	7,628 7,933 8,283	13,730 14,280 14,910	....	Do.
Lothair; one-half mile southeast of; Ashless mine, Fire Clay, Dean, or No. 4 bed (face of 1 main entry, 700 feet from mine mouth).	21349	A	1	4.1	36.3	54.8	4.8	.6	......	......	......	......	2.3	7,583	13,650	2,540	Do.
Same (face of 2 main entry)...........	21350	A	1	3.8	36.1	56.1	4.0	.7	......	......	......	......	2.0	7,656	13,780	2,610	Do.
Same (face of 2 left entry, 500 feet from mine mouth).	21351	A	1	4.3	36.6	53.8	5.3	.7	......	......	......	......	2.6	7,511	13,520	......	Do.
Same (face of 2 right entry, 550 feet from mine mouth).	21352	A	1	4.2	35.8	53.3	6.7	.6	......	......	......	......	2.6	7,378	13,280	2,320	Do.
Same (composite of samples 21349 to 21352, inclusive).	21353	A	1 2 3	4.2	36.6 38.2 40.4	54.0 56.3 59.6	5.2 5.5	.6 .7 .7	5.5 5.3 5.6	76.5 79.8 84.4	1.7 1.8 1.9	10.5 6.9 7.4	2.4	7,528 7,856 8,311	13,550 14,140 14,960	....	Do.
One mile north of, Kentucky Jewel mine, Flag or No. 7 bed (face of 3 main entry, 600 feet from mine mouth).	21344	A	1	4.9	34.5	53.1	7.5	.8	......	......	......	......	2.8	7,256	13,060	2,910	Do.
Same (face of 4 main entry, 500 feet from mine mouth).	21345	A	1	4.0	36.6	53.6	5.8	.7	......	......	......	......	2.0	7,494	13,490	2,970	Do.
Same (face of 1 entry, 1,400 feet from mine mouth).	21346	A	1	5.0	35.8	52.8	6.4	.9	......	......	......	......	2.9	7,339	13,210	2,730	Do.
Same (face of 5 entry, 400 feet from mine mouth).	21347	A	1	4.3	34.4	52.3	9.0	.8	......	......	......	......	2.2	7,172	12,910	2,910	Do.
Same (composite of samples 21344 to 21347, inclusive).	21348	A	1 2 3	4.5	35.4 37.1 40.1	52.9 55.4 59.9	7.2 7.5	.7 .8 .8	5.4 5.1 5.5	83.9 77.4 83.7	1.6 1.7 1.9	11.2 7.5 8.1	2.5	7,322 7,672 8,294	13,180 13,810 14,930	....	Do.
NOTE.—Several coals from along the North Fork of the Kentucky River.																	
North Fork:																	
Lost Creek, 15-mile branch of, Combs and Horton land, Flag coal (outcrop)	2733	D	4 2	2.5	35.5 36.4	52.5 53.8	9.5 9.8	1.1 1.1	....	....	....	....	....	*7,200 7,383	12,960 13,290	....	Kentucky Geological Survey, 1910.
Two miles above Sixteen Mile Creek of, J. H. Campbell's land, Flag coal (outcrop).	2732	D	4 2	2.1	38.6 39.4	54.2 55.4	5.1 5.2	.8 .9	....	....	....	....	....	*7,789 7,956	14,020 14,320	....	Do.

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TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
PERRY COUNTY—continued.																	
North Forks—Continued.																	
Combs Branch, Henry Engle bank, Hazard bed (muddy outcrop)	2542	D	4	1.5	31.6	56.5	10.4	.9	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	32.0	57.4	10.6	.9	......	......	......	......	......	......	......	......	
Same (weathered splint coal, lower part of bed).	2543	D	4	3.0	32.8	56.1	8.1	1.3	......	......	......	......	......	......	......	......	Do.
			2	......	33.8	57.9	8.3	1.4	......	......	......	......	......	......	......	......	
Grapevine Creek, old J. Spencer opening, Fire Clay Rider.	2789	D	4	4.4	30.3	54.9	10.4	.5	......	......	......	......	......	......	......	......	Do.
			2	......	31.7	57.4	10.9	.5	......	......	......	......	......	......	......	......	
Eversole Branch of, Fire Clay, No. 4 bed (outcrop).	2788	D	4	3.2	34.9	52.3	9.6	.8	......	......	......	......	......	......	......	......	Do.
			2	......	36.1	54.0	9.9	.8	......	......	......	......	......	......	......	......	
Carnegie Branch, 2 miles above Big Creek, Alexander Combs's land, Fire Clay bed (outcrop).	2793	D	4	1.8	36.0	56.2	6.0	.6	......	......	......	......	......	......	......	......	Do
			2	......	36.7	57.2	6.1	.6	......	......	......	......	......	......	......	......	
Lots Creek, Helen Combs Branch of, old Fielding opening, Fire Clay bed (outcrop).	2541	D	4	5.2	31.9	52.9	10.0	.6	......	......	......	......	......	......	......	......	Do.
			2	......	33.6	55.8	10.6	.6	......	......	......	......	......	......	......	......	
Walker Branch of, J. H. Combs opening, Fire Clay bed (outcrop).	2546	D	4	1.5	33.5	61.2	3.8	.8	......	......	......	......	......	......	......	......	Do.
			2	......	34.0	62.1	3.9	.8	......	......	......	......	......	......	......	......	
David Grigsby's bank (bituminous coal above cannel coal).	1942	D	4	1.8	40.9	53.7	3.6	1.3	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	41.7	54.6	3.7	1.4	......	......	......	......	......	......	......	......	
Same (cannel coal, lower part of bed).	1943	D	4	1.2	40.9	48.4	9.5	.6	......	......	......	......	......	......	......	......	Do.
			2	......	41.4	49.0	9.6	.6	......	......	......	......	......	......	......	......	
Hazard, near, Josiah Cobb's land (upper part of bed, outcrop).	1938	D	4	2.1	36.2	58.2	3.5	.8	......	......	......	......	......	......	......	......	Do.
			2	......	37.0	59.4	3.6	.9	......	......	......	......	......	......	......	......	
On North Fork of Kentucky River below Hazard, R. C. Combs's bank (outcrop).	1940	D	4	2.1	36.7	56.3	4.9	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	37.5	57.5	5.0	1.5	......	......	......	......	......	......	......	......	
Maces Creek, Campbell's bank (weathered outcrop).	1939	D	4	3.7	30.6	57.1	8.6	.7	......	......	......	......	......	......	......	......	Do.
			2	......	31.8	59.2	9.0	.7	......	......	......	......	......	......	......	......	
Middle Fork of the Kentucky River, one-fourth mile above Squabble Creek, Peter Gross mine, Haddix bed (face of entry, 25 yards in entry).	2795	D	4	1.9	37.1	57.9	3.1	.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1910.
			2	......	37.8	59.0	3.2	.8	......	......	......	......	......	......	......	......	
One-fourth mile up Guys Creek, Fire Clay bed (muddy outcrop, upper part of bed).	2790	D	4	3.4	31.0	55.3	10.3	.6	......	......	......	......	......	......	......	......	Do.
			2	......	32.1	57.2	10.7	.6	......	......	......	......	......	......	......	......	

One mile above Leatherwood Creek, Haddix bed (outcrop, cannel part).	2784	D	4	.8	44.8	37.6	16.8	1.0									Do.
			2		45.2	37.9	16.9	1.0									
Oldhouse Branch, 1 mile up, Henry Begley land, Hazard bed (face of entry, 10 yards in entry).	2734	D	4	1.9	38.3	52.4	7.4	.7						*7,561	13,610		Do.
			2		39.0	53.5	7.5	.7						7,711	13,880		
PIKE COUNTY.																	
Hellier, Edgewater mine, Lower Elkhorn bed (face of main entry).	3085	D	4	1.7	32.4	64.1	1.8	.5						8,244	14,840		Do.
			2		33.0	65.2	1.8	.5						8,383	15,090		
Greenough mine, above mouth of Cassell Fork of Marrowbone Creek, Upper Elkhorn bed (600 feet from mine mouth).	3708	B	1	4.0	32.5	58.7	4.8	.7					2.8				U. S. Geological Survey, 1906.
			2		33.8	61.2	5.0	.8									
Same	3083	D	4	1.7	33.0	60.0	5.3	.6						7,522	13,540		Kentucky Geological Survey, 1910.
			2		33.6	61.1	5.3	.6						7,650	13,770		
Same (face of main entry)	3089	D	4	1.5	35.7	61.7	1.1	.6						8,200	14,760		Do.
			2		36.2	62.7	1.1	.7						8,322	14,980		
Same, Lower Elkhorn bed (face of 3 left air course).	3094	D	4	1.6	32.8	60.8	4.8	.6						*7,539	13,570		Do.
			2		33.3	61.8	4.9	.6						7,661	13,790		
Pike County mine (face of 1 right entry).	3088	D	4	1.7	35.5	61.7	1.1	.6						8,178	14,720		Do.
			2		36.1	62.8	1.1	.6						8,317	14,970		
Same, Lower Elkhorn bed (face of 3 left air course).	3095	D	4	1.7	31.4	62.7	4.2	.4						*7,783	14,010		Do.
			2		31.9	63.8	4.3	.5						7,917	14,250		
One mile above, Cassell Fork of Marrowbone Creek, Pike mine, Lower Elkhorn bed (700 feet from entrance, excluding laminated coal).	3706	B	1	3.4	31.8	60.7	4.1	.5					1.7				U. S. Geological Survey, 1906.
			2		32.9	62.9	4.2	.6									
Same (laminated coal only), 22-inch upper bench).	3702	B	1	3.2	25.8	48.6	22.4	.4					1.8				Do.
			2		26.7	50.2	23.1	.4									
Same (500 feet south and 600 feet west of opening, 75 feet from outcrop, 1 right heading).	6928	B	1	3.7	30.0	59.5	6.8	.6	5.1	76.3	1.1	10.1	2.6	7,583	13,650		Do.
			2		31.2	61.7	7.1	.6	4.8	79.3	1.1	7.1		7,878	14,180		
			3		33.6	66.4		.6	5.2	85.3	1.2	7.7		8,478	15,260		
Same (1,600 feet south of opening, main heading, right parallel entry 4).	6929	B	1	3.4	32.1	58.8	5.7	.5	5.2	77.0	1.8	10.3	2.0	7,739	13,930		Do.
			2		33.2	60.9	5.9	.6	5.0	79.3	1.2	7.6		8,011	14,420		
			3		35.3	64.7		.6	5.3	84.8	1.3	8.0		8,517	15,330		
Two and one-half miles west of, head of Cassell Fork, Musgrove prospect, Flatwoods bed (6⅔-foot cut, top bench).	3829	B	1	3.5	33.7	54.5	8.3	.8					1.7				Do.
			2		34.9	56.6	8.5	.9									
Lookout, Henry Clay mine, Lower Elkhorn bed (face of 6 room, 2 left entry).	3086	D	4	1.8	33.0	62.2	3.0	.7						7,883	14,190		Kentucky Geological Survey, 1910.
			2		33.6	63.3	3.1	.7						8,022	14,440		
Same, Upper Elkhorn bed (face of main entry).	3090	D	4	1.6	35.6	60.1	2.7	.7						8,028	14,450		Do.
			2		36.2	61.1	2.7	.7						8,150	14,670		
Regina, near Coleman Hollow, Coleman mine, Millard bed).	3662	B	1	3.0	32.2	56.6	8.2	1.1					1.4				U. S. Geological Survey, 1906.
			2		33.2	58.4	8.4	1.1									
Two miles east of, Martin bank, on right-hand branch of Road Creek, Lower Elkhorn bed (40 feet in entry).	3663	B	1	4.7	31.6	61.6	2.1	.7					3.2				Do.
			2		33.2	64.6	2.2	.8									
Four miles south of, Pond Creek, below mouth of Laurel Branch, Moore bank, Lower Elkhorn bed (30 feet from mine mouth).	3661	B	1	5.3	27.7	59.8	7.2	.5					3.4				Do.
			2		29.3	63.1	7.6	.5									

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TABLE 1.—*Chemical analyses of mine samples*—Continued.

EASTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
PIKE COUNTY—continued.																	
Sprig (W. Va.); one-half mile south of; Burnwell No. 2 mine, No. 2 Gas bed (9 room, 4 left entry, main entry, 2,000 feet from mine mouth).	17459	A	1	3.2	33.0	58.7	5.1	.6	5.3	78.5	1.4	9.1	1.4	7,711	13,880	2,940	Bureau of Mines, 1918.
			2	......	34.1	60.6	5.3	.6	5.1	81.1	1.5	6.4	......	7,967	14,340	......	
			3	......	36.0	64.0	......	.7	5.4	85.5	1.5	6.9	......	8,406	15,130	......	
Thacker (W. Va.); 1½ miles southwest of; Little Thacker mine, Alum bed (1 right entry, main air course, 700 feet from outcrop).	17460	A	1	2.5	34.9	58.3	4.3	.6	5.2	79.9	1.5	8.5	1.0	7,917	14,250	+3,010	Do.
			2	......	35.7	59.9	4.4	.6	5.1	81.9	1.5	6.5	......	8,117	14,610	......	
			3	......	37.4	62.6	......	.6	5.3	85.7	1.6	6.8	......	8,489	15,280	......	
Same, Thacker bed (last right entry, 2 drift, 3,000 feet from mine mouth).	17461	A	1	2.8	36.2	56.7	4.3	1.4	5.4	79.3	1.5	8.1	1.3	7,878	14,180	2,410	Do.
			2	......	37.2	58.4	4.4	1.4	5.2	81.5	1.5	6.0	......	8,100	14,580	......	
			3	......	39.0	61.0	......	1.5	5.5	85.3	1.6	6.1	......	8,478	15,260	......	
POWELL COUNTY.																	
Dundee, 1 mile from; Clear Branch, No. 1 coal (lowest coal above the limestone).	2822	D	4	3.0	37.6	43.8	15.6	4.6	......	......	......	......	......	*6,100	10,980	......	Kentucky Geological Survey, 1910.
			2	......	38.8	45.2	16.0	4.7	......	......	......	......	......	6,289	11,320	......	
PULASKI COUNTY.																	
Cumberland coal banks, 2 miles south of river, 9 miles from Rockcastle Springs (50 feet from mine mouth).	1944	D	4	2.4	36.8	50.2	10.2	2.5	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.7	51.4	10.9	2.5	......	......	......	......	......	......	......	......	
Doolin coal bank, 1 mile from river, 10 miles from Rockcastle Springs (head of entry, 75 feet from mine mouth).	1945	D	4	2.0	35.3	52.9	9.8	3.6	......	......	......	......	......	......	......	......	Do.
			2	......	36.0	54.0	10.0	3.7	......	......	......	......	......	......	......	......	
ROCKCASTLE COUNTY.																	
Livingston; Grisham's coal mine, Upper "Brashy Coal" bed.	1949	D	4	2.2	35.9	54.9	7.0	4.3	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	36.7	56.1	7.2	4.4	......	......	......	......	......	......	......	......	
Myzner's and Myers's bank, entry No. 1 (150 yards in entry)	1947	D	4	2.0	36.7	51.9	9.4	2.2	......	......	......	......	......	......	......	......	Do.
			2	......	37.4	53.0	9.6	2.3	......	......	......	......	......	......	......	......	
Same, entry No. 2	1948	D	4	2.2	36.5	51.7	9.6	4.8	......	......	......	......	......	......	......	......	Do.
			2	......	37.3	52.9	9.8	4.9	......	......	......	......	......	......	......	......	

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WHITLEY COUNTY.																	
Barthell; No. 1 mine, No. 2 bed (face of 14 room, 6 left entry).	10062	A	1	2.9	40.2	47.4	9.5	3.1	5.4	71.1	1.1	9.8	1.4	7,217	12,990	2,340	Bureau of Mines, 1913.
			2		41.3	48.9	9.8	3.2	5.3	73.2	1.1	7.4		7,428	13,370		
			3		45.8	54.2		3.5	5.8	81.2	1.3	8.2		8,233	14,820		
Gatliff; Acme Blue Gem mine	3160	D	4	2.2	44.1	49.9	3.8	2.9						7,806	14,050		Kentucky Geological Survey, 1910.
			2		45.1	51.0	3.9	3.0						7,983	14,370		
Halsey; Anderson mine	2751	D	4	1.9	27.3	43.7	27.1	.9						*6,017	10,830		Do.
			2		27.9	44.5	27.6	.9						6,139	11,050		
Kensee; Main Jellico mines, Jellico bed (new mine).	1329	B	1	5.0	36.1	54.5	4.4	.9					2.6	7,561	13,610		U. S. Geological Survey, 1913.
			2		38.0	57.3	4.7	1.0						7,961	14,330		
Same (old mine)	1330	B	1	5.5	35.2	56.7	2.6	.9					2.4				Do.
			2		37.3	60.0	2.7	1.0									
Mount Morgan mine, Jellico bed (face of 4 entry, 24 room, 11 entry, average of two samples).	2796	D	4	1.2	37.5	58.5	2.8	1.2						*7,839	14,110		Kentucky Geological Survey, 1910.
			2		38.0	59.1	2.9	1.2						7,933	14,280		
Williamsburg; Gatliff mine (top bench)	3058	D	4	2.3	43.3	52.2	2.2	.6						*7,844	14,120		Do.
			2		44.3	53.5	2.2	.6						8,033	14,460		
Same (middle bench)	3059	D	4	2.4	40.8	54.5	2.3	.9						*7,583	13,650		Do.
			2		41.8	55.9	2.3	.9						7,772	13,990		
Same (bottom bench)	3060	D	4	2.4	40.0	55.6	2.0	.7						*7,533	13,560		Do.
			2		40.9	57.1	2.0	.7						7,711	13,880		
Same (average of samples 3058, 3059, and 3060).	3061	D	4	2.1	41.7	53.9	2.3	.7						7,517	13,530		Do.
			2		42.6	55.1	2.3	.7						7,672	13,810		
WOLF COUNTY.																	
Campton; Henry Alexander's bank	2823	D	4	3.3	36.7	52.3	7.7	2.1						6,967	12,540		Kentucky Geological Survey, 1910.
			2		37.9	54.1	8.0	2.2						7,206	12,970		
C. M. Hanks's bank	1963	D	4	3.7	35.5	52.7	8.1	2.6									Kentucky Geological Survey 1890.
			2		36.9	54.7	8.4	2.6									
Four and one-half miles from; Hobb's bank on Benjamin Baker's land (splint coal).	1966	D	4	3.5	35.2	56.7	4.6	1.2									Do.
			2		36.5	58.7	4.8	1.2									

WESTERN KENTUCKY FIELD.

BUTLER COUNTY.																	
Green River, 2 miles from; Stevens's bank on Bear Creek.	1313	D	4	3.4	30.7	54.9	11.0	2.5									Kentucky Geological Survey, 1890.
			2		31.7	56.9	11.4	2.6									
Morgantown, 1½ miles southwest of; Gillam mine (left rib, 1 room, main west entry, 100 feet from mine mouth).	19399	A	1	8.9	39.3	43.6	8.2	3.1					3.6	6,689	12,040	2,180	Bureau of Mines, 1918.
Same (left rib, 1 room, main west entry, 100 feet from mine mouth).	19400	A	1	8.5	40.0	44.4	7.1	3.7					3.2	6,828	12,290	2,020	Do.
Same (composite of samples 19399 and 19400).	19401	A	1	8.8	39.6	44.0	7.6	3.5	5.7	67.1	1.6	14.5	3.4	6,750	12,150		Do.
			2		43.4	48.3	8.3	3.8	5.2	73.5	1.8	7.4		7,400	13,320		
			3		47.3	52.7		4.2	5.7	80.2	1.9	8.0		8,067	14,520		
Mud Creek, mouth of; Mining City coal bank (new opening).	1995	D	4	3.3	44.2	48.5	4.0	3.1									Kentucky Geological Survey, 1890.
			2		45.7	50.2	4.1	3.2									

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
CHRISTIAN COUNTY.																	
Empire, three-quarter mile west of; Empire mine, Empire bed (face of main south entry, 3,000 from shaft bottom).	19293	A	1	11.2	34.5	52.7	1.6	.8	......	......	......	......	6.6	7,056	12,700	....	Bureau of Mines, 1918.
Same (face of 8 west entry, south entry, 2,000 feet from shaft bottom).	19294	A	1	10.8	35.5	50.6	3.1	1.5	......	......	......	......	5.7	6,961	12,530	1,880	Do.
Same (face of 1 north entry, 6 west entry, 3,500 feet from shaft bottom).	19295	A	1	9.6	37.0	47.2	6.2	2.6	......	......	......	......	5.5	6,839	12,310	1,930	Do.
Same (face of 6 west entry, 4,060 feet from shaft bottom).	19296	A	1	11.2	35.8	48.6	4.4	2.1	......	......	......	......	6.9	6,789	12,220	1,960	Do.
Same (composite of samples 19293 to 19296, inclusive).	19297	A	1	10.8	35.7	49.7	3.8	1.8	5.9	70.0	1.7	16.8	6.2	6,900	12,420	....	Do.
			2	......	40.0	55.7	4.3	2.0	5.2	78.5	1.9	8.1	......	7,733	13,920	....	
			3	......	41.8	58.2	......	2.1	5.4	82.0	1.9	8.6	......	8,078	14,540	....	
Petersburg, at station; Miners' Cooperation mine, J coal.	1721	D	4	3.7	32.6	50.0	13.7	3.7	......	......	......	......	......	......	......	....	Kentucky Geological Survey, 1890.
			2	......	33.8	52.0	14.2	3.9	......	......	......	......	......	......	......	....	
Two miles south of; L coal (weathered)	1720	D	4	5.1	32.5	55.7	6.7	1.3	......	......	......	......	......	......	......	....	Do.
			2	......	34.3	58.6	7.1	1.4	......	......	......	......	......	......	......	....	
Mannington; William's mine, Empire bed (face of 1 room, 2 north entry, 80 feet from entry).	W70506	A	1	9.1	34.9	46.9	9.1	2.9	......	......	......	......	......	6,644	11,960	....	Bureau of mines. In print.
			2	......	38.4	51.6	10.0	3.2	......	......	......	......	......	7,311	13,160	....	
Same (face of 4 room, 2 west entry, 110 feet from entry).	W70507	A	1	9.0	33.6	47.7	9.7	3.7	......	......	......	......	......	6,583	11,850	....	Do.
			2	......	36.9	52.4	10.7	4.0	......	......	......	......	......	7,233	13,020	....	Do.
Same (face of 1 south entry)	W70508	A	1	9.7	34.4	49.4	6.5	2.3	......	......	......	......	......	6,839	12,310	....	Do.
			2	......	38.0	54.8	7.2	2.6	......	......	......	......	......	7,572	13,630	....	
CRITTENDEN COUNTY.																	
Blackford; 2 miles from; designated as No. 1 coal.	3042	D	4	2.1	31.7	60.5	5.7	1.4	......	......	......	......	......	*7,594	13,670	....	Kentucky Geological Survey, 1910.
			2	......	32.3	61.9	5.8	1.4	......	......	......	......	......	7,750	13,950	....	
Same, designated as No. 2 coal	3043	D	4	2.2	31.9	60.7	5.1	1.4	......	......	......	......	......	*7,300	13,140	....	Do.
			2	......	32.3	61.5	5.2	1.4	......	......	......	......	......	7,389	13,300	....	
Sullivan; 3 miles west of; Barnaby mine (200 feet east of mine mouth).	22894	A	1	4.4	36.8	51.1	7.7	3.4	......	......	......	......	2.5	7,383	13,290	2,160	Bureau of Mines, 1918.
			2	......	38.5	53.4	8.1	3.6	......	......	......	......	......	7,722	13,900	....	
Three miles east of; Newcome mine (500 feet northeast of mine mouth).	22895	A	1	4.4	35.9	52.9	6.8	3.4	......	......	......	......	2.2	7,467	12,440	2,220	Do.
			2	......	37.5	55.4	7.1	3.6	......	......	......	......	......	7,806	14,050	....	

DAVIESS COUNTY.																	
Knottsville, near; Friendly Grove, Richardson's land, Duncan's bank.	1761	D	4	6.2	41.9	47.4	4.5	3.7	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	44.7	50.5	4.8	4.0	......	......	......	......	......	......	......	......	
Owensboro; 1½ miles above; Dean's mine, D coal.	1760	D	4	5.1	34.7	51.5	8.7	3.5	......	......	......	......	......	......	......	......	Do.
			2	......	36.6	54.2	9.2	3.7	......	......	......	......	......	......	......	......	
Same, Dutch mine, D coal	1758	D	4	4.1	38.5	51.0	6.4	1.5	......	......	......	......	......	......	......	......	Do.
			2	......	40.2	53.1	6.7	1.6	......	......	......	......	......	......	......	......	
Same, Montgomery's mine, D coal (?).	1757	D	4	6.2	36.2	50.9	6.7	1.5	......	......	......	......	......	......	......	......	Do.
			2	......	38.6	54.3	7.1	1.6	......	......	......	......	......	......	......	......	
Three miles northwest of; Fulkerson mine, No. 9 bed (2 room, main entry, 800 feet from slope mouth).	18970	A	1	10.9	36.9	40.8	11.4	3.9	......	......	......	......	3.5	6,067	10,920	2,010	Bureau of Mines, 1918.
Same (1 room, main entry, 800 feet from slope mouth.	18971	A	1	12.4	36.5	41.0	10.1	3.7	......	......	......	......	5.1	6,067	10,920	2,080	Do.
Same (composite of samples 18970 and 18971).	18972	A	1	11.6	36.5	41.1	10.8	3.8	5.4	60.2	1.4	18.4	4.3	6,056	10,900	......	Do.
			2	......	41.2	46.6	12.2	4.3	4.7	68.1	1.6	9.1	......	6,844	12,320	......	
			3	......	47.0	53.0	......	4.9	5.3	77.6	1.8	10.4	......	7,794	14,030	......	
Three miles west of; George Rudy mine, No. 9 bed (face of 6 north entry, 2,000 feet from shaft).	18958	A	1	12.1	36.6	42.7	8.6	2.8	......	......	......	......	3.5	6,289	11,320	2,060	Do.
Same (face of 15 room, 5 north entry, 2,200 feet from shaft).	18959	A	1	11.5	36.6	41.6	10.3	3.0	......	......	......	......	3.4	6,167	11,100	2,190	Do.
Same (face of main west, 1,800 feet from shaft).	18960	A	1	12.1	35.8	42.5	9.6	3.8	......	......	......	......	3.9	6,150	11,070	2,060	Do.
Same (composite of samples 18958 to 18960, inclusive).	18961	A	1	11.9	36.8	41.9	9.4	3.3	5.5	62.1	1.4	18.3	3.6	6,194	11,150	......	Do.
			2	......	41.7	47.7	10.6	3.7	4.7	70.5	1.6	8.9	......	7,028	12,650	......	
			3	......	46.7	53.3	......	4.1	5.3	78.8	1.7	10.1	......	7,867	14,160	......	
Three miles west of; Bon Harbor Hills, Owensboro mine.	2870	D	4	7.9	33.7	44.7	13.7	4.0	......	......	......	......	......	*6,522	11,740	......	Kentucky Geological Survey, 1910.
			2	......	36.6	48.5	14.9	4.4	......	......	......	......	......	7,078	12,740	......	
Bon Harbor mines, Barrett's new opening, D coal.	1759	D	4	5.8	35.1	50.4	8.7	4.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.2	53.5	9.3	4.2	......	......	......	......	......	......	......	......	
EDMONDSON COUNTY.																	
Bear Creek, Mill Branch of (level of main Nolin coal).	1414	D	4	3.6	33.0	54.4	9.0	2.1	......	......	......	......	......	......	......	......	Do.
			2	......	34.2	56.5	9.3	2.2	......	......	......	......	......	......	......	......	
At Gross	1417	D	4	1.2	39.0	45.5	14.3	8.7	......	......	......	......	......	......	......	......	Do.
			2	......	39.5	46.0	14.5	8.8	......	......	......	......	......	......	......	......	
Davis Creek, Tar Lick	1413	D	4	2.3	32.1	56.3	9.3	1.1	......	......	......	......	......	......	......	......	Do.
			2	......	32.9	57.6	9.5	1.1	......	......	......	......	......	......	......	......	
Same (main Nolin coal)	1419	D	4	4.1	33.2	51.7	11.0	1.7	......	......	......	......	......	......	......	......	Do.
			2	......	34.7	53.8	11.5	1.7	......	......	......	......	......	......	......	......	
Dismal Creek, Knob Lick (main Nolin coal).	1416	D	4	2.6	33.8	53.1	10.5	2.4	......	......	......	......	......	......	......	......	Do.
			2	......	34.7	54.6	10.7	2.5	......	......	......	......	......	......	......	......	
Shoal Branch of (Nolin coal)	1418	D	4	3.7	35.1	54.3	6.9	2.7	......	......	......	......	......	......	......	......	Do.
			2	......	36.5	56.3	7.2	2.8	......	......	......	......	......	......	......	......	

Note.—Samples marked (W) were analyzed in the Washington laboratories of the Bureau of Mines.

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
GRAYSON COUNTY.																	
Bear Creek, Miller's Fork of, Gravelly Lick.	1449	D	4	4.1	30.5	50.1	15.3	3.6	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	31.8	52.3	15.9	3.7	......	......	......	......	......	......	......	......	
Cane Camp Creek, Gum Spring Fork of; Nolin Furnace property (part above parting, weathered).	1453	D	4	6.5	29.1	49.6	14.8	.8	......	......	......	......	......	......	......	......	Do.
			2	......	31.1	53.1	15.8	.9	......	......	......	......	......	......	......	......	
Galloway Creek, Brushy Branch of; near Schoolhouse, W. B. McGrew's land, (weathered).	1450	D	4	6.3	32.4	53.8	7.5	1.5	......	......	......	......	......	......	......	......	Do.
			2	......	34.6	57.4	8.0	1.6	......	......	......	......	......	......	......	......	
Dismal Creek, Tar Lick Branch of........	1448	D	4	4.7	31.4	52.2	11.7	2.0	......	......	......	......	......	......	......	......	Do.
			2	......	33.0	54.7	12.3	2.1	......	......	......	......	......	......	......	......	
Rock Creek, Hunting Fork Branch of; Copperas bank (impure coal).	1451	D	4	3.5	33.4	47.5	15.6	2.0	......	......	......	......	......	......	......	......	Do.
			2	......	34.6	49.2	16.2	2.1	......	......	......	......	......	......	......	......	
Pearson's Fork of, L. Higdom's land (below conglomerate).	1452	D	4	3.6	35.8	49.4	11.2	3.2	......	......	......	......	......	......	......	......	Do.
			2	......	37.1	51.3	11.6	2.3	......	......	......	......	......	......	......	......	
Rough Creek, near Falls of, South of Allen bank.	1787	D	4	6.5	30.0	55.6	7.9	2.0	......	......	......	......	......	......	......	......	Do.
			2	......	32.1	59.4	8.5	2.1	......	......	......	......	......	......	......	......	
HANCOCK COUNTY.																	
Cloverport; 8 miles south of; Cloverport mine (at main breast, 12 entry, cannel coal).	1813	D	4	1.3	59.6	27.0	12.1	1.9	......	......	......	......	......	......	......	......	
			2	......	60.4	27.3	12.3	1.9	......	......	......	......	......	......	......	......	
Hawesville, near; Davidson bank.........	1822	D	4	3.3	39.0	50.5	7.2	3.4	......	......	......	......	......	......	......	......	Do.
			2	......	40.3	52.2	7.5	3.5	......	......	......	......	......	......	......	......	
Same, R. S. Lanum's bank...........	1823	D	4	6.0	37.8	48.7	7.5	3.2	......	......	......	......	......	......	......	......	Do.
			1	......	40.2	51.8	8.0	3.4	......	......	......	......	......	......	......	......	
Below; Hancock mine...............	1814	D	4	5.1	36.2	47.7	11.0	4.0	......	......	......	......	......	......	......	......	Do.
			2	......	38.2	50.2	11.6	4.3	......	......	......	......	......	......	......	......	
Three miles from; Lead Creek, Breidenback bank.	1821	D	4	5.1	41.2	46.6	7.1	3.3	......	......	......	......	......	......	......	......	Do.
			2	......	43.4	49.1	7.5	3.5	......	......	......	......	......	......	......	......	
Same, Milton Lawson's bank.........	1815	D	4	5.4	34.8	49.3	10.5	2.4	......	......	......	......	......	......	......	......	Do.
			2	......	36.8	52.1	11.1	2.5	......	......	......	......	......	......	......	......	
Between Hawesville and Lewisport; James Mason's bank.	1817	D	4	4.8	38.9	50.1	6.2	2.3	......	......	......	......	......	......	......	......	Do.
			2	......	40.9	52.5	6.6	2.4	......	......	......	......	......	......	......	......	

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Lewisport; near; Colbert's bank	1818	D	4	4.5	37.6	47.5	10.4	7.8	......	......	......	......	......	......	......	......	Do.
			2	......	39.4	49.7	10.9	8.2	......	......	......	......	......	......	......	......	
Back of; Robert Estes' bank	1816	D	4	3.5	43.4	45.5	7.6	4.2	......	......	......	......	......	......	......	......	Do.
			2	......	45.0	47.2	7.8	4.3	......	......	......	......	......	......	......	......	
HENDERSON COUNTY.																	
Baskett; No. 1 mine, No. 9 bed (face of main south entry, 3,000 feet from shaft).	18962	A	1	12.2	35.6	42.3	9.9	2.9	......	......	......	......	3.9	6,183	11,130	2,020	Bureau of Mines, 1918.
Same (face of 1 west entry, main south entry, 1,400 feet from shaft).	18963	A	1	10.1	35.7	42.8	11.4	2.9	......	......	......	......	2.0	6,233	11,220	2,040	Do.
Same (face of 29 room, 2 east south entry, 3,500 feet from shaft).	18964	A	1	10.4	37.3	42.7	9.6	2.6	......	......	......	......	2.4	6,333	11,400	2,100	Do.
Same (face of main entry, 2,600 feet from shaft).	18965	A	1	11.4	36.8	42.4	9.4	3.5	......	......	......	......	3.9	6,272	11,290	1,910	Do.
Same (composite of samples 18962 to 18965, inclusive).	18966	A	1	11.1	36.3	42.6	10.0	3.1	5.5	62.6	1.4	17.4	3.0	6,256	11,260	......	Do.
			2	......	40.8	47.9	11.3	3.5	4.8	70.4	1.5	8.5	......	7,033	12,660	......	
			3	......	46.0	54.0	......	3.9	5.4	79.3	1.7	9.7	......	7,928	14,270	......	
Pittsburgh mine, No. 9 bed (average of samples taken from Reeds room right north entry, and 2 room, 1 right south entry).	2869	D	4	7.6	35.0	46.0	11.4	2.5	......	......	......	......	......	*6,656	11,980	......	Kentucky Geological Survey, 1910.
			2	......	37.8	49.8	12.4	2.8	......	......	......	......	......	7,200	12,960	......	
Same (face of main south heading)	3108	D	4	5.8	35.7	48.2	10.3	3.1	......	......	......	......	......	6,533	11,760	......	Do.
			2	......	37.9	51.1	11.0	3.3	......	......	......	......	......	6,939	12,490	......	
Bluff City; John Archbold mine, No. 9 bed.	3107	D	4	5.7	35.2	42.6	16.5	6.3	......	......	......	......	......	5,889	10,600	......	Do.
			2	......	37.4	45.1	17.5	6.7	......	......	......	......	......	6,244	11,240	......	
Same	3219	D	4	11.3	35.0	44.2	9.5	3.3	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	39.4	49.9	10.7	3.7	......	......	......	......	......	......	......	......	
Corydon; Corydon mine, No. 12 bed (face of 8 room, 2 south entry, 1,000 feet from shaft).	19103	A	1	12.1	35.3	41.2	11.4	3.3	......	......	......	......	5.4	5,967	10,740	1,860	Bureau of Mines, 1918.
Same (face of 8 room, 2 north entry, 1,000 feet from shaft).	19104	A	1	11.8	34.2	41.3	12.7	3.1	......	......	......	......	6.5	5,922	10,660	1,990	Do.
Same (face of 1 north entry, 800 feet from shaft).	19105	A	1	10.9	36.5	42.8	9.8	2.6	......	......	......	......	4.8	6,206	11,170	2,030	Do.
Same (face of 2 south entry, 1,000 feet from shaft).	19106	A	1	10.7	35.5	42.6	11.2	3.1	......	......	......	......	5.0	6,117	11,010	2,010	Do.
Same (composite of samples 19103 to 19106, inclusive).	19107	A	1	11.3	35.7	41.6	11.4	2.9	5.3	60.8	1.4	18.2	5.4	6,056	10,900	......	Do.
			2	......	40.3	46.9	12.8	3.3	4.6	68.6	1.6	9.1	......	6,822	12,280	......	
			3	......	46.2	53.8	......	3.8	5.3	78.7	1.8	10.4	......	7,828	14,090	......	
Henderson; 1½ miles south of; Nicholson mine, No. 9 bed (face of 4 room, 2 west entry, 1,250 feet from shaft).	18973	A	1	11.3	36.6	41.4	10.7	2.9	......	......	......	......	4.9	6,178	11,120	2,080	Do.
Same (face of 1 west entry, 1,200 feet from shaft).	18974	A	1	11.8	36.5	40.6	11.1	3.4	......	......	......	......	5.1	6,089	10,960	2,480	Do.
Same (composite of samples 18973 and 18974).	18975	A	1	11.6	36.2	41.4	10.8	3.2	5.4	61.3	1.4	17.9	5.0	6,133	11,040	......	Do.
			2	......	40.9	46.9	12.2	2.6	4.7	69.3	1.6	8.6	......	6,933	12,480	......	Do.
			3	......	46.6	53.4	......	4.1	5.3	79.0	1.8	9.8	......	7,900	14,220	......	
Keystone mine (face of main heading 550 feet from shaft).	2905	D	4	3.1	35.7	45.0	16.2	7.8	......	......	......	......	......	*6,411	11,540	......	Kentucky Geological Survey, 1910.
			2	......	36.9	46.4	16.7	8.0	......	......	......	......	......	6,617	11,910	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HENDERSON COUNTY—continued.																	
Robards; Three-fourths mile south of; Panama mine, No. 9 bed (face of 27 room, 3 south entry, 1,800 feet from shaft).	18976	A	1	9.9	36.5	43.8	9.8	3.4	......	......	......	......	4.3	6,356	11,440	1,990	Bureau of Mines, 1918.
Same (face of 3 north entry, 1,600 feet from shaft).	18977	A	1	9.6	37.6	42.0	10.8	4.1	......	......	......	......	4.4	6,178	11,120	2,080	Do.
Same (composite of samples 18976 and 18977).	18978	A	1	9.7	37.0	43.0	10.3	3.8	5.3	62.2	1.4	17.0	4.3	6,256	11,260	......	Do.
			2	......	41.0	47.6	11.4	4.2	4.7	68.9	1.6	9.2	......	6,928	12,470	......	
			3	......	46.3	53.7	......	4.7	5.3	77.7	1.8	10.5	......	7,817	14,070	......	
Smith Mills; Smith Mills mine, No. 12 bed.	3110	D	4	7.6	32.2	49.2	11.0	2.2	......	......	......	......	......	*6,322	11,380	......	Kentucky Geological Survey, 1910.
			2	......	34.9	53.2	11.9	2.3	......	......	......	......	......	6,839	12,310	......	
Same (face of 12 room, 4 north entry, 1,200 feet from shaft).	19108	A	1	13.3	32.5	44.7	9.5	2.0	......	......	......	......	4.9	6,039	10,870	1,990	Bureau of Mines, 1918.
Same (face of 11 room, 3 north entry, 1,100 feet from shaft).	19109	A	1	12.6	32.9	46.1	8.4	1.8	......	......	......	......	6.5	6,206	11,170	2,020	Do.
Same (face of 4 west entry, 1,200 feet from shaft).	19110	A	1	13.4	34.1	44.9	7.6	1.7	......	......	......	......	5.4	6,244	11,240	2,110	Do.
Same (face of 5 room, main north entry, 1,200 feet from shaft).	19111	A	1	12.7	33.0	47.0	7.3	1.6	......	......	......	......	5.0	6,322	11,380	2,140	Do.
Same (composite of samples 19108 to 19111, inclusive).	19112	A	1	13.0	33.4	45.3	8.3	1.8	5.5	62.9	1.4	20.1	5.5	6,228	11,210	......	Do.
			2	......	38.4	52.1	9.5	2.1	4.6	72.3	1.7	9.8	......	7,156	12,880	......	
			3	......	42.4	57.6	......	2.3	5.1	79.9	1.8	10.9	......	7,906	14,230	......	
Spottsville; Green River mine, No. 9 bed.	3109	D	4	5.8	38.1	46.9	9.2	2.7	......	......	......	......	......	6,789	12,220	......	Kentucky Geological Survey, 1910.
			2	......	40.4	49.8	9.8	2.9	......	......	......	......	......	7,206	12,970	......	
Utopia; Utopia mine, No. 9 bed..........	3105	D	4	6.2	34.7	46.9	12.2	2.6	......	......	......	......	......	6,589	11,860	......	Do.
			2	......	37.0	50.0	13.0	2.8	......	......	......	......	......	7,028	12,650	......	
Zion; Zion mine, No. 9 bed..............	3106	D	4	6.1	37.2	46.0	10.7	3.2	......	......	......	......	......	*6,394	11,910	......	Do.
			2	......	39.6	49.0	11.4	3.5	......	......	......	......	......	6,806	12,250	......	
HOPKINS COUNTY.																	
Barnsley; Barnsley mine, No. 9 bed (face of 3 west entry, 52-inch cut).	1361	B	1	9.1	36.2	46.6	8.1	3.0	......	......	......	......	3.3	......	......	......	U. S. Geological Survey, 1905.
			2	......	39.8	51.3	8.9	3.3	......	......	......	......	......	......	......	......	
Same (break through between 3 and 4 north entries, 4½-foot cut).	1367	B	1	8.0	37.6	45.1	9.3	4.0	......	......	......	......	2.2	6,650	11,970	......	Do.
			2	......	40.8	49.1	10.1	4.4	......	......	......	......	......	7,222	13,000	......	

Dawson Springs; One mile north of; J. W. Workman mine, Dawson bed (face of main east entry, 500 feet east of shaft).	19298	A	1	9.0	39.0	47.7	4.3	2.7	......	......	......	......	5.6	7,056	12,700	2,120	Bureau of Mines, 1918.
Same (face of 3 room, main east room, 500 feet from shaft).	19299	A	1	8.2	39.2	48.8	3.8	2.3	......	......	......	......	5.2	7,150	12,870	2,020	Do.
Same (left rib near face of 2 room, air course, 500 feet from shaft).	19300	A	1	9.0	36.8	47.6	6.6	3.7	......	......	......	......	4.8	6,867	12,360	2,250	Do.
Same (right rib of face of 2 room, air course, 500 feet from shaft).	19301	A	1	8.8	37.8	48.1	5.3	2.7	......	......	......	......	4.6	6,961	12,530	2,000	Do.
Same (composite of samples 19298 to 19301, inclusive).	19302	A	1	8.8	37.8	48.3	5.1	2.8	5.7	70.3	1.6	14.5	4.8	6,983	12,570	......	Do.
			2	......	41.5	53.0	5.5	3.1	5.2	77.2	1.8	7.2	......	7,661	13,790	......	
			3	......	43.9	56.1	......	3.2	5.5	81.7	1.9	7.7	......	8,106	14,590	......	
Earlington; one-half mile southeast of; No. 9 mine, No. 9 bed (face of main north entry, 4,000 feet from mine mouth).	19204	A	1	8.5	35.7	45.8	10.0	4.0	......	......	......	......	4.7	6,528	11,750	2,100	Do.
Same (face of 100 room, 7 east entry, 8,000 feet from mine mouth).	19205	A	1	8.4	37.1	46.7	7.8	3.8	......	......	......	......	4.6	6,706	12,070	2,120	Do.
Same (rib of 16 east entry, opposite 37 room, 5,000 feet from mine mouth).	19206	A	1	8.7	36.6	45.5	9.2	3.2	......	......	......	......	4.7	6,583	11,850	2,090	Do.
Same (face of 39 room, 13 east entry, 5,000 feet from mine mouth).	19207	A	1	8.7	36.2	45.5	9.6	3.6	......	......	......	......	4.8	6,556	11,800	2,310	Do.
Same (rib of 92 room, 7 east entry, 7,500 feet from mine mouth).	19208	A	1	8.1	37.1	45.6	9.2	3.4	......	......	......	......	4.4	6,622	11,920	2,010	Do.
Same (rib of 10 east entry, 65 room, 8,000 feet from mine mouth).	19209	A	1	8.7	36.5	44.5	10.3	3.1	......	......	......	......	5.0	6,506	11,710	2,050	Do.
Same (face of 14 east entry, 5,000 feet from mine mouth).	19210	A	1	8.4	36.9	46.0	8.7	3.8	......	......	......	......	4.7	6,656	11,980	1,980	Do.
Same (face of 62 room, 60 feet from 10 east entry, 5,000 feet from mine mouth).	19211	A	1	9.5	36.4	45.6	8.5	2.8	......	......	......	......	5.2	6,578	11,840	2,080	Do.
Same (composite of samples 19204 to 19211, inclusive).	19212	A	1	8.5	36.4	45.9	9.2	3.5	5.4	65.9	1.4	14.6	4.8	6,600	12,880	......	Do.
			2	......	39.8	50.1	10.1	3.8	4.9	72.1	1.5	7.6	......	7,217	12,990	......	
			3	......	44.2	55.8	......	4.2	5.4	80.2	1.7	8.5	......	8,028	14,450	......	
No. 11 mine, No. 11 bed (10 room, 3 west entry, 84-inch cut).	1365	B	1	8.5	38.1	46.3	7.1	3.5	......	......	......	......	2.9	6,856	12,340	......	U. S. Geological Survey, 1905.
			2	......	41.6	50.6	7.8	3.9	......	......	......	......	......	7,494	13,490	......	
Same (15 room, 4 west entry, 62-inch cut).	1366	B	1	7.8	37.6	44.4	10.2	4.2	......	......	......	......	2.6	......	......	......	Do.
			2	......	40.8	48.1	11.1	4.6	......	......	......	......	......	......	......	......	
Three-fourth mile south of; Diamond mine, D coal (side of entrance).	1829	D	4	5.0	35.3	49.2	10.5	3.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.1	51.8	11.1	3.2	......	......	......	......	......	......	......	......	
One mile below; Fleming mine, B coal (bottom part of bed).	1831	D	4	3.0	36.9	49.1	11.0	6.0	......	......	......	......	......	......	......	......	Do.
			2	......	38.1	50.6	11.3	6.2	......	......	......	......	......	......	......	......	
Same (top part of bed)...............	1832	D	4	2.7	40.7	51.7	4.9	1.5	......	......	......	......	......	......	......	......	Do.
			2	......	41.9	53.0	5.1	1.5	......	......	......	......	......	......	......	......	
Near; Hecla mine, B coal............	1833	D	4	3.3	39.3	49.5	7.9	4.7	......	......	......	......	......	......	......	......	Do.
			2	......	40.7	51.2	8.1	4.9	......	......	......	......	......	......	......	......	
Same, D coal.........................	1836	D	4	2.3	37.7	51.0	9.0	3.6	......	......	......	......	......	......	......	......	Do.
			2	......	38.6	52.2	9.2	3.7	......	......	......	......	......	......	......	......	
St. Bernard mines, D coal (upper drift).	1830	D	4	4.3	37.6	50.6	7.5	2.9	......	......	......	......	......	......	......	......	Do.
			2	......	39.3	52.9	7.8	3.0	......	......	......	......	......	......	......	......	

TABEE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HOPKINS COUNTY—continued.																	
Eureka: Eureka mine, No. 11 bed (face sample, 6 inches, west entry).		D	4	3.3	40.6	50.2	5.9	3.5									Smith, Rudy & Co., Philadelphia, 1912.
			2		41.9	52.0	6.1	3.7									
Same (8 inches, west entry)		D	4	3.4	38.8	50.7	7.1	2.4									Do.
			2		40.2	52.4	7.4	2.5									
Same (10 inches, west entry)		D	4	3.5	40.6	49.7	6.2	3.3									Do.
			2		42.1	51.5	6.4	3.4									
Same (12 inches, west entry)		D	4	3.5	39.9	49.9	6.7	3.3									Do.
			2		41.5	51.5	7.0	3.5									
Same (16 inches, west entry)		D	4	3.3	41.2	48.8	6.7	3.3									Do.
			2		42.6	50.5	6.9	3.4									
Same (18 inches, east entry)		D	4	4.0	41.4	47.4	7.2	3.0									Do.
			2		43.2	49.3	7.5	3.2									
Same (18 inches, west entry)		D	4	3.2	40.5	46.6	9.7	4.9									Do.
			2		41.8	48.1	10.1	5.1									
NOTE.—The analyses from the Eureka mine, by Smith Rudy & Co., Philadelphia, are copied from bulletins of the Kentucky Geological Survey.																	
Madisonville; 1 mile west of; Reinecke mine, No. 11 bed (face of 8 west entry, main north entry, 1¾ miles from shaft).	19194	A	1	6.5	39.7	46.4	7.4	3.8					3.3	6,944	12,500	2,310	Bureau of Mines, 1918.
Same (face of 10 west entry, 1¾ miles from shaft).	19195	A	1	6.3	39.9	45.7	8.1	3.7					3.2	6,883	12,390	2,080	Do.
Same (face of 15 room, 5 west entry, 1½ miles from shaft).	19196	A	1	5.9	41.0	45.3	7.8	3.4					2.7	6,972	12,550	2,170	Do.
Same (face of main north entry, 1¼ miles from shaft).	19197	A	1	5.4	40.3	47.6	6.7	3.5					2.3	7,089	12,760	2,000	Do.
Same (face of 12 west entry, at 1 south entry, 1¼ miles from shaft).	19198	A	1	6.5	39.1	45.3	9.1	4.2					3.0	6,761	12,170	1,960	Do.
Same (1 room, 16 east entry, main south entry, 2 miles from shaft).	19199	A	1	7.2	39.9	47.5	5.4	3.3					3.5	7,039	12,670	1,990	Do.
Same (face of 8 room, 16 east air course, 1¾ miles southeast of shaft).	19200	A	1	6.0	40.7	47.2	6.1	3.4					2.9	7,089	12,760	2,070	Do.

Same (rib of 6 west entry, opposite 8 room, 1½ miles from shaft).	19201	A		1	6.3	39.9	47.0	6.8	3.8	......	......	......	......	3.9	6,994	12,590	2,020	Do.
Same (face of 14 west entry, 20 room, 2 miles southwest of shaft).	19202	A		1	6.9	38.3	45.2	9.6	4.5	......	......	......	......	3.9	6,683	12,030	1,990	Do.
Same (composite of samples 19194 to 19202, inclusive).	19203	A		1	6.2	39.9	46.4	7.5	3.7	5.5	69.2	1.3	12.8	3.1	6,933	12,480	......	Do.
				2	......	42.5	49.5	8.0	4.0	5.1	73.8	1.4	7.7	......	7,389	13,300	......	
				3	......	46.2	53.8	......	4.3	5.5	80.2	1.5	8.5	......	8,033	14,460	......	
Seven miles east of; C. U. Parker's mine, No. 14 bed.	3208	D		1	8.1	34.9	48.8	8.2	3.2	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
				2	......	37.9	53.2	8.9	3.5	......	......	......	......	......	......	......	......	
Same	3210	D		1	7.3	35.2	50.0	7.5	3.0	......	......	......	......	......	......	......	......	Do.
				2	......	38.0	53.9	8.1	3.2	......	......	......	......	......	......	......	......	
Nebo; 3 miles south of; Nebo mine, No. 14 bed (last cut-through, 2 east entry, north entry, 3,000 feet from mine mouth).	19230	A		1	9.4	35.3	43.3	12.0	3.7	......	......	......	......	6.0	6,217	11,190	2,030	Bureau of Mines, 1918.
Same (face of 15 room 1 east entry, 3,000 feet from mine mouth).	19231	A		1	8.5	35.2	48.4	7.9	2.6	......	......	......	......	4.1	6,661	11,990	2,040	Do.
Same (rib of 5 room, 1 north entry, 3,000 feet from mine mouth).	19232	A		1	7.7	36.8	49.2	6.3	2.2	......	......	......	......	3.2 X	6,856	12,340	2,380	Do.
Same (face of 2 room, 3 east entry, north entry, 3,200 feet from mine mouth).	19233	A		1	9.1	34.1	47.2	9.6	3.1	......	......	......	......	5.1	6,533	11,760	1,990	Do.
Same (face of 1 west entry, 1 north entry, 3,400 feet from mine mouth).	19234	A		1	8.8	35.5	47.5	8.2	2.5	......	......	......	......	4.1	6,633	11,940	1,900	Do.
Same (2 east break-through, 40 feet from intersection of 4 east and north entries, 3,600 feet from mine mouth).	19235	A		1	9.7	35.8	48.4	6.1	2.2	......	......	......	......	5.4	6,706	12,070	2,080	Do.
Same (composite of samples 19230 to 19235, inclusive).	19236	A		1	8.9	35.3	47.4	8.4	2.8	5.4	67.2	1.5	14.7	4.7	6,623	11,920	......	Do.
				2	......	38.7	52.1	9.2	3.1	4.9	73.7	1.7	7.4	......	7,267	13,080	......	
				3	......	42.6	57.4	......	3.4	5.3	81.2	1.9	8.2	......	8,000	14,400	......	
Same (face sample)	10500	D		4	5.2	37.9	50.9	6.0	2.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
				2	......	40.0	53.7	6.3	2.1	......	......	......	......	......	......	......	......	
Nortonville; 1,000 feet west of; Norton No. 1 mine, No. 11 bed (face of 23 room, 1 west back heading, 2,500 feet from shaft).	19237	A		1	7.4	39.4	45.9	7.3	3.7	......	......	......	......	3.6	6,817	12,270	1,950	Bureau of Mines, 1918.
Same (face of 27 room, 2 east entry, 2,500 feet from shaft).	19238	A		1	8.4	38.4	46.2	7.0	3.3	......	......	......	......	4.5	6,783	12,210	2,100	Do.
Same (face of 23 room, 2 west entry, 3,000 feet from shaft).	19239	A		1	7.6	38.0	46.5	7.9	3.9	......	......	......	......	4.0	6,728	12,110	1,980	Do.
Same (face of 2 east entry, air-course, 3,000 feet east of shaft).	19240	A		1	7.7	39.1	46.7	6.5	3.4	......	......	......	......	4.3	6,878	12,380	1,980	Do.
Same (face of 25 room, 1 west entry, 2,500 feet west of shaft).	19241	A		1	7.9	39.2	46.8	6.1	3.1	......	......	......	......	3.5	6,889	12,400	2,130	Do.
Same (face of 2 west entry, 3,000 feet west of shaft).	19242	A		1	7.8	38.6	47.0	6.6	3.5	......	......	......	......	3.4	6,844	12,320	2,080	Do.
Same (composite of samples 19237 to 19242, inclusive).	19243	A		1	7.9	38.9	46.2	7.0	3.5	5.5	68.5	1.3	14.2	3.9	6,822	12,280	......	Do.
				2	......	42.2	50.2	7.6	3.8	5.1	74.4	1.4	7.7	......	7,406	13,330	......	
				3	......	45.7	54.3	......	4.2	5.5	80.5	1.5	8.3	......	8,017	14,430	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
HOPKINS COUNTY—continued.																	
St. Charles; 2 miles northwest of; Carbondale No. 1 mine, No. 9 bed (face of 7 west entry, 6 north entry, 4,500 feet from mine mouth).	19261	A	1	8.9	37.7	45.9	7.5	2.5	......	......	......	......	6.1	6,678	12,020	2,190	Bureau of Mines, 1918.
Same (face of 3 main north entry, 2,000 feet from mine mouth).	19262	A	1	9.5	36.5	46.2	7.8	3.1	......	......	......	......	6.6	6,567	11,820	2,010	Do.
Same (neck of 12 room, 6 east entry, 3 north entry, 2,000 feet from mine mouth).	19263	A	1	8.2	37.5	44.4	9.9	3.7	......	......	......	......	5.4	6,450	11,610	1,940	Do.
Same (face of 3 east entry, 3 north entry, 3,000 feet from mine mouth).	19264	A	1	10.1	36.4	46.4	7.1	3.2	......	......	......	......	6.8	6,611	11,900	2,010	Do.
Same (face of 22 room, 3 east entry, 3 north entry, 3,000 feet from mine mouth).	19265	A	1	8.5	37.3	45.7	8.5	3.7	......	......	......	......	5.4	6,623	11,920	2,030	Do.
Same (face of 9 room, 5 east entry, 5 north entry, 5,000 feet from mine mouth).	19266	A	1	8.5	37.3	45.5	8.7	3.6	......	......	......	......	5.5	6,583	11,850	1,910	Do.
Same (composite of samples 19261 to 19266, inclusive).	19267	A	1	9.0	37.0	45.7	8.3	3.3	5.5	66.1	1.4	15.4	6.0	6,594	11,870	......	Do.
			2	......	40.7	50.2	9.1	3.6	5.0	72.6	1.6	8.1	......	7,244	13,040	......	Do.
			3	......	44.7	55.3	......	4.0	5.5	79.9	1.7	8.9	......	7,967	14,340	......	
Two miles northeast of; Fox Run mine, No. 9 bed (face of 40 room, 10 east entry, 3,500 feet from mine mouth).	19252	A	1	8.6	37.3	45.4	8.7	3.2	......	......	......	......	3.2	6,600	11,880	2,070	Do.
Same (face of 11 room, 12 east entry, 3,000 feet from mine mouth).	19253	A	1	8.9	37.9	45.7	7.5	2.2	......	......	......	......	3.3	6,678	12,020	2,140	Do.
Same (face of 9 west entry, 3,500 feet from mine mouth).	19254	A	1	9.6	37.2	46.0	7.2	2.8	......	......	......	......	3.9	6,678	12,020	1,940	Do.
Same (face of 7 west entry, 3,500 feet from mine mouth).	19255	A	1	7.8	37.8	45.7	8.7	3.8	......	......	......	......	3.4	6,628	11,930	1,960	Do.
Same (rib of 35 room, 10 east entry, 3,500 feet southeast of mine mouth).	19256	A	1	8.5	37.5	44.4	9.6	3.6	......	......	......	......	3.3	6,517	11,730	1,960	Do.
Same (rib of 9 room, 13 east entry, 3,000 feet from mine mouth).	19257	A	1	8.5	34.8	43.2	13.5	2.6	......	......	......	......	5.4	6,217	11,190	2,170	Do.

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Same (face of 15 east entry, 3,000 feet from mine mouth).	19258	A	1	8.5	37.2	46.3	8.0	3.2	......	......	......	......	5.2	6,678	12,020	2,010	Do.
Same (face of 2 room, 7 west entry, 3,000 feet from mine mouth).	19259	A	1	8.5	37.3	44.0	10.2	3.7	......	......	......	......	5.4	6,478	11,660	1,930	Do.
Same (composite of samples 19252 to 19259, inclusive).	19260	A	1	8.6	37.0	45.0	9.4	3.1	5.5	65.5	1.4	15.2	4.1	6,567	11,820	......	Do.
			2	......	40.5	49.3	10.2	3.4	4.9	71.6	1.5	8.4	......	7,189	12,940	......	
			3	......	45.1	54.9	......	3.8	5.5	79.8	1.7	9.2	......	8,006	14,410	......	
St. Charles mine, No. 9 bed (D coal)..	1579	D	4	3.2	35.9	54.0	6.9	2.8	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.1	55.8	7.1	2.9	......	......	......	......	......	......	......	......	
Ilsley; Crabtree mine, No. 9 bed (38 room, 10 east entry).	3103	D	4	4.5	37.9	49.7	7.9	2.9	......	......	......	......	......	6,811	12,260	......	Kentucky Geological Survey, 1912.
			2	......	39.7	52.1	8.2	3.0	......	......	......	......	......	7,128	12,830	......	
Same (in crosscut between 7 and 8 east entries).	3104	D	4	5.3	37.1	48.4	9.2	3.6	......	......	......	......	......	7,011	12,620	......	Do.
			2	......	39.1	51.1	9.8	3.8	......	......	......	......	......	7,406	13,330	......	
Oak Hill mine (face of 9 room, 1 south entry, 14 room, 1 south entry).	2789	D	4	1.7	40.0	50.1	8.2	2.8	......	......	......	......	......	*6,567	11,820	......	Kentucky Geological Survey, 1910.
			2	......	40.7	51.0	8.3	2.9	......	......	......	......	......	6,683	12,030	......	
M'LEAN COUNTY.																	
Island; Green River mine, No. 9 bed (face of 1 room, 1 north entry, east side of shaft).	2901	D	4	2.9	39.5	49.2	8.4	3.5	......	......	......	......	......	*6,753	12,160	......	Do.
			2	......	40.7	50.6	8.7	3.6	......	......	......	......	......	6,956	12,520	......	
Same (face of 1 room, 3 north entry, east side of shaft).	2902	D	4	2.7	37.4	47.8	12.1	2.9	......	......	......	......	......	*7,022	12,640	......	Do.
			2	......	38.4	49.2	12.4	2.9	......	......	......	......	......	7,217	12,990	......	
Alva Karnes mine, No. 9 bed (face of main east entry).	2903	D	4	2.6	41.2	47.1	9.1	3.3	......	......	......	......	......	*6,650	11,970	......	Do.
			2	......	42.3	48.3	9.4	3.4	......	......	......	......	......	6,822	12,280	......	
Same (face of 1 room, 2 west entry)...	2904	D	4	2.5	42.0	46.8	8.7	3.1	......	......	......	......	......	*6,883	12,390	......	Do.
			2	......	43.1	48.0	8.9	3.2	......	......	......	......	......	7,061	12,710	......	
O'Neil mine, No. 9 bed (face of 4 room, 3 south entry, 600 feet from shaft).	19281	A	1	9.4	37.3	43.3	10.0	3.4	......	......	......	......	5.4	6,467	11,640	2,020	Bureau of Mines, 1918.
Same (face of main west entry, 750 feet from shaft).	19282	A	1	9.6	39.1	42.9	8.4	2.7	......	......	......	......	6.2	6,583	11,850	2,170	Do.
Same (face of 6 room, 2 south entry, 400 feet southwest of shaft).	19283	A	1	9.3	38.5	43.0	9.2	2.7	......	......	......	......	5.1	6,544	11,780	2,170	Do.
Same (face of 6 room, 1 south entry, 400 feet southwest of shaft).	19284	A	1	8.6	38.1	42.2	11.1	3.8	......	......	......	......	4.7	6,467	11,640	1,980	Do.
Same (composite of samples 19281 to 19284, inclusive).	19285	A	1	9.3	38.0	43.0	9.7	3.1	5.6	65.0	1.3	15.3	5.4	6,522	11,740	......	Do.
			2	......	41.9	47.4	10.7	3.5	5.0	71.7	1.5	7.6	......	7,183	12,930	......	
			3	......	46.9	53.1	......	3.9	5.6	80.2	1.7	8.6	......	8,044	14,480	......	
Whitesburg, near (prospect).............	1889	D	4	3.3	36.0	57.9	2.8	1.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.2	59.9	2.9	1.1	......	......	......	......	......	......	......	......	
MUHLENBURG COUNTY.																	
Airdrie Furnace; No. 12 coal (near No. 4 entry).	1618	D	4	3.6	31.4	58.5	6.5	1.4	......	......	......	......	......	......	......	......	Do.
			2	......	32.6	60.7	6.7	1.5	......	......	......	......	......	......	......	......	
Same, Paradise mine, No. 11 coal of Owen (lowest division of bed).	1620	D	4	4.2	36.1	50.5	9.2	4.6	......	......	......	......	......	......	......	......	Do.
			2	......	37.7	52.7	9.6	4.8	......	......	......	......	......	......	......	......	
Same (middle layer of bed)...........	1621	D	4	4.1	35.9	53.6	6.4	4.4	......	......	......	......	......	......	......	......	Do.
			2	......	37.4	55.9	6.7	4.6	......	......	......	......	......	......	......	......	
Same (upper layer of bed)............	1622	D	4	3.6	38.7	53.7	4.0	3.2	......	......	......	......	......	......	......	......	Do.
			2	......	40.2	55.6	4.2	3.3	......	......	......	......	......	......	......	......	
Muddy River mine....................	1623	D	4	3.8	32.7	58.6	4.9	1.9	......	......	......	......	......	......	......	......	Do.
			2	......	34.0	60.9	5.1	2.0	......	......	......	......	......	......	......	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
MUHLMNBURG COUNTY—continued.																	
Bevier; Lam mine, No. 9 bed (rib of 21 room, 2 west entry, 1 south entry, 4,000 feet from mine mouth).	19331	A	1	8.8	37.4	44.1	9.7	4.4					3.8	6,539	11,770	1,990	Bureau of Mines, 1918.
Same (face of 3 east blind entry, 4,000 feet from mine mouth).	19332	A	1	8.2	36.8	45.5	9.5	3.7					4.0	6,589	11,860	2,030	Do.
Same (face of 22 room, 4 east entry, 1 south entry, 4,000 feet from mine mouth).	19333	A	1	9.1	37.5	45.1	8.3	3.1					5.3	6,623	11,920		Do.
Same (last break through, 3 west entry, 1 south entry, 2 west entry, 2,500 feet from mine mouth).	19334	A	1	9.0	37.5	45.8	7.7	3.3					4.7	6,683	12,030	1,980	Do.
Same (face of 2 south entry, 4 east entry, 3,500 feet from mine mouth).	19335	A	1	8.9	38.1	44.2	8.8	3.5					5.0	6,572	11,830	1,870	Do.
Same (break-through, opposite 61 room, 2 east entry, 3,500 feet from mine mouth).	19336	A	1	9.6	36.2	45.1	9.1	3.3					4.9	6,533	11,760	1,900	Do.
Same (composite of samples 19331 to 19336, inclusive).	19337	A	1	8.8	37.3	45.1	8.8	3.5	5.5	66.1	1.4	14.7	4.6	6,594	11,870		Do.
			2		40.9	49.4	9.7	3.9	5.0	77.2	1.6	7.3		7,233	13,020		
			3		45.3	54.7		4.3	5.5	80.2	1.7	8.3		8,006	14,410		
Central City; Central mine, No. 9 bed (43 room, 14 north entry, 1¼ miles northeast of shaft).	2453	B	1	8.8	35.0	46.8	9.4	4.1					5.7	6,650	11,970		U. S. Geological Survey, 1906.
			2		38.4	51.3	10.3	4.5						7,283	13,110		
Same (9 room, 14 south entry, 1¼ miles south of shaft).	2454	B	1	8.8	34.0	46.4	10.8	3.7					3.9				Do.
			2		37.3	50.9	11.8	4.0									
Same (face of main south entry)	13257	A	1	8.1	38.2	47.1	6.6	2.4					5.0			2,070	Bureau of Mines, 1914.
Same (face of 20 room, main south blind entry).	13258	A	1	10.3	35.9	44.6	9.2	3.0					7.4			1,970	Do.
Same (face of 3 room, 6 south entry, main west entry).	13259	A	1	8.0	37.8	47.2	7.0	2.5					5.1			2,230	Do.
Same (composite of samples 13257 to 13259, inclusive).	13260	A	1	8.7	37.8	45.9	7.6	2.7	5.5	67.7	1.4	15.1	5.8	6,783	12,200		Do.
			2		41.4	50.3	8.3	2.9	5.0	74.1	1.6	8.1		7,428	13,370		
			3		45.1	54.9		3 2	5.4	80.8	1.7	8.9		8,100	14,580		

Cleaton; Bevier mine, No. 9 bed (face of 15 room, 8 north air course, 4,100 feet from shaft).	15339	A	1	8.0	37.8	45.7	8.5	2.8					5.1	6,689	12,040	1,930	Do.
			2		41.1	49.7	9.2	3.0						7.267	13,080		
Same (face of 21 room, 7 north entry, 3,800 feet from shaft).	15340	A	1	8.3	38.0	44.5	9.2	3.4					5.4	6,578	11,840	1,900	Do.
			2		41.4	48.6	10.0	3.7						7,178	12,920		
Same (face of 8 south entry, 4,500 feet from shaft).	15341	A	1	8.2	36.0	45.2	10.6	3.8					5.5	6,467	11,640	1,960	Do.
			2		39.3	49.1	11.6	4.1						7,044	12,680		
Six miles east of; Harrison Curdiff mine, No. 11 bed.	3212	D	1	7.4	38.3	48.0	6.3	2.9									Kentucky Geological Survey, 1912.
			2		41.3	51.9	6.8	3.1									
Six miles northeast of; Henry Kipling mine, No. 11 bed.	3211	D	1	7.4	39.1	45.6	7.9	3.9									Do.
			2		42.2	49.2	8.6	4.2									
Drakesboro; near; Diamond Block mines No. 9 bed.	3075	D	4	5.0	36.5	41.4	17.1	2.9						*6,044	10,880		Kentucky Geological Survey, 1910.
			2		38.5	43.5	18.0	3.1						6,367	11,460		
Earles, one-half mile west of; A. H. Cotton mine, No. 11 bed.	3215	D	1	6.5	39.4	46.5	7.6	3.9									Kentucky Geological Survey, 1912.
			2		42.2	49.7	8.1	4.2									
Three miles southeast of; W. E. Evitt mine, No. 11 bed.	3213	D	1	7.7	40.0	45.7	6.6	3.6									Do.
			2		43.4	49.4	7.2	3.9									
Graham; 2 miles north of; Skibo mine, No. 9 bed (face of 2 west entry, 1 north entry, 4,000 feet from mine mouth).	16674	A	1	8.8	36.2	46.4	8.6	3.6	5.3	65.3	1.5	15.7	5.4	6,611	11,900	1,970	Bureau of Mines, 1914.
			2		39.6	51.0	9.4	3.9	4.8	71.7	1.6	8.6		7,250	13,050		
			3		43.8	56.2		4.3	5.3	79.1	1.8	9.5		8,006	14,410		
Same (face of 2 room, 7 east entry, 3,600 feet northeast of mine mouth).	16675	A	1	8.2	36.4	45.3	10.1	3.3	5.4	65.2	1.6	14.4	5.1	6,544	11,780	2,030	Do.
			2		39.6	49.4	11.0	3.6	4.9	71.1	1.7	7.7		7,128	12,830		
			3		44.5	55.5		4.1	5.5	79.8	1.9	8.7		8,006	14,410		
Luzerne; 1½ miles north of; J. T. Wright mine, No. 9 bed).	3214	D	1	9.1	36.9	45.4	8.6	2.6									Kentucky Geological Survey, 1912.
			2		40.7	49.9	9.4	2.9									
One mile north of; Sam Jarvis mine, No. 11 bed.	3217	D	1	8.0	39.4	47.1	5.5	2.6									Do.
			2		42.9	51.1	6.0	2.8									
Mercer; Mercer coal mine, D coal	1625	D	4	3.6	34.0	50.6	11.8	4.0									Kentucky Geological Survey, 1890.
			2		35.3	52.5	12.2	4.2									
Muhlenberg mines, B coal (face of main entry)	1627	D	4	1.5	40.0	50.9	7.6	2.8									Do.
			2		40.6	51.7	7.7	2.9									
Same (head of main entry)	1628	D	4	3.0	43.1	50.2	3.7	3.1									Do.
			2		44.4	51.8	3.8	3.2									
Moorman; W. P. Robertson's shaft	3070	D	4	6.5	35.0	50.4	8.1	2.5						*6,650	11,970		Kentucky Geological Survey, 1910.
			2		37.4	53.9	8.7	2.7						2,711	12,800		
Owensboro Junction; Louisville and Stroud City mines, B coal.	1899	D	4	3.4	37.9	52.7	6.0	2.7									Kentucky Geological Survey, 1890.
			2		39.2	54.6	6.2	2.8									
St. Louis mines, B coal	1901	D	4	5.4	34.2	54.2	6.2	3.1									Do.
			2		36.2	57.2	6.6	3.3									
One and one-half miles north of; Rothrock's mine, B coal (upper bench).	1903	D	4	3.8	36.2	51.8	8.2	3.2									Do.
			2		37.6	53.9	8.5	3.3									
OHIO COUNTY.																	
Barrett's Creek, A. Woodward's bank (outcrop).	1923	D	4	2.7	39.3	45.9	5.1	8.0									Do.
			2		40.4	47.2	12.4	8.2									
Ben's Lick, Point Pleasant road, William's coal bank, D coal.	1913	D	4	3.5	36.3	50.9	9.3	3.5									Do
			2		37.6	52.8	9.6	3.7									
Centertown; 1½ miles northwest of; Brown's mine, No. 14 bed.	3207	D	1	8.7	36.3	45.8	9.1	4.1									Kentucky Geological Survey, 1912.
			2		39.8	50.2	10.0	4.5									
Four miles southwest of; C. G. Kimbly's mine, No. 14 bed.	3209	D	1	9.2	32.6	50.2	8.0	2.5									Do.
			2		35.9	55.3	8.8	2.7									

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELDS—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
OHIO COUNTY—continued.																	
Hartford; 3 miles from; Rough Creek, mouth of Brush Creek, E. coal.	1918	D	4	4.8	35.8	45.2	14.2	3.0	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1890.
			2	......	37.6	47.5	14.9	3.2	......	......	......	......	......	......	......	......	
Rough Creek, C. W. Stephen's land ...	1908	D	4	5.0	36.7	55.7	2.6	1.6	......	......	......	......	......	......	......	......	Do.
			2	......	38.7	58.6	2.7	1.7	......	......	......	......	......	......	......	......	
Four and one-half miles from; Rough Creek, G. B. Hocker's bank.	1909	D	4	5.9	33.8	56.9	3.4	1.0	......	......	......	......	......	......	......	......	Do.
			2	......	35.9	60.5	3.6	1.1	......	......	......	......	......	......	......	......	
McHenry; near McHenry mine, No. 9 bed (face of 4 room, 3 south entry, 9,000 feet from mine mouth).	15102	A	1	9.9	35.9	43.4	10.8	3.6	5.4	62.3	1.3	16.6	7.0	6,328	11,390	......	Bureau of Mines, 1914.
			2	......	39.9	48.1	12.0	4.0	4.7	69.1	1.5	8.7	......	7,022	12,640	......	
			3	......	45.3	54.7	......	4.6	5.4	78.5	1.7	9.8	......	7,983	14,370	......	
Same (face of 1 room, 4 north entry, 8,500 feet from mine mouth).	15103	A	1	10.0	36.5	44.9	8.6	2.6	5.5	65.0	1.4	16.9	7.0	6,539	11,770	2,120	Do.
			2	......	40.6	49.9	9.5	2.9	4.9	72.2	1.6	8.9	......	7,267	13,080	......	
			3	......	44.8	55.2	......	3.2	5.4	79.8	1.7	9.9	......	8,028	14,450	......	
Two miles west of; Broadway mine, No. 9 bed (200 feet west of shaft).	3722	B	1	10.0	36.1	46.2	7.7	2.6	......	......	......	......	3.3	6,711	12,080	......	U. S. Geological Survey, 1908.
			2	......	40.1	51.4	8.5	2.9	......	......	......	......	......	7,456	13,420	......	
Same (550 feet north of shaft)	3723	B	1	9.9	35.7	45.7	8.7	2.5	......	......	......	......	2.9	6,628	11,930	......	Do.
			2	......	39.6	50.8	9.6	2.7	......	......	......	......	......	7,356	13,240	......	
Rockport; one-fourth mile northwest of; Crown mine, No. 9 bed (face of 11 room 6 north entry, main east entry, 1,600 feet from shaft).	19338	A	1	9.7	35.9	45.1	9.3	3.3	......	......	......	......	5.1	6,506	11,710	2,000	Bureau of Mines, 1918.
Same (face of main east blind entry, 1,800 feet from shaft).	19339	A	1	10.2	35.6	44.7	9.5	2.7	......	......	......	......	5.3	6,406	11,530	2,090	Do.
Same (face of 7 south entry, 2,000 feet from shaft).	19340	A	1	9.3	35.7	43.7	11.3	3.8	......	......	......	......	4.3	6,339	11,410	1,890	Do.
Same (15 feet from entry, 19 room, 5 south entry 1,800 feet from shaft).	19341	A	1	9.9	35.3	44.5	10.3	3.8	......	......	......	......	5.3	6,389	11,500	2,070	Do.
Same (neck of 46 room, 3 south entry, 2,200 feet from shaft).	19342	A	1	9.0	36.5	46.1	8.4	3.0	......	......	......	......	4.0	6,628	11,930	2,080	Do.
Same (intersection of 1 east and 4 north entries, 1,200 feet from shaft).	19343	A	1	9.1	35.6	43.9	11.4	4.1	......	......	......	......	3.6	6,344	11,420	2,120	Do.
Same (composite of samples 19338 to 19343, inclusive).	19344	A	1	9.5	35.7	44.8	10.0	3.4	5.5	64.7	1.4	15.0	4.6	6,406	11,530	......	Do.
			2	......	39.4	49.6	11.0	3.8	4.9	71.5	1.6	7.2	......	7,078	12,740	......	
			3	......	44.2	55.8	......	4.2	5.5	80.3	1.8	8.2	......	7,950	14,310	......	
South Carrollton; one-half mile southeast of; Foley's mine, No. 14 bed.	3216	D	1	11.5	32.2	46.7	9.6	2.2	......	......	......	......	......	......	......	......	Kentucky Geological Survey, 1912.
			2	......	36.4	52.8	10.8	2.5	......	......	......	......	......	......	......	......	

UNION COUNTY.																	
Dekoven; one-half mile southeast of; Banks mine, No. 10 bed (2 east entry, 200 feet northeast of mine mouth).	23011	A	1	5.5	35.0	47.6	11.9	4.0	......	......	......	......	3.4	6,789	12,220	1,970	Bureau of Mines, 1918.
			2	......	37.0	50.4	12.6	4.2	......	......	......	......	......	7,183	12,930	......	
Two miles north of; Curlew mine, No. 9 bed (in slope 2,000 feet from mine mouth).	23010	A	1	3.9	37.1	49.7	9.3	3.5	......	......	......	......	1.9	7,128	12,830	2,000	Do.
			2	......	38.6	51.7	9.7	3.6	......	......	......	......	......	7,417	13,350	......	
Three-fourths mile northeast of; Ohio Valley mine, No. 9 bed (face of 6 west entry, 1¼ miles from mine mouth).	19169	A	1	4.4	37.5	48.0	10.1	2.5	......	......	......	......	2.5	6,967	12,540	2,030	Do.
Same (face of 7 west entry, 1¼ miles from mine mouth).	19170	A	1	4.3	36.1	47.8	11.8	4.0	......	......	......	......	2.6	6,867	12,360	1,990	Do.
Same (face of 6 east level, 8,400 feet from mine mouth).	19171	A	1	5.4	35.7	44.6	15.3	3.7	......	......	......	......	3.6	6,500	11,700	2,040	Do.
Same (face of 7 east level, 3,900 feet from foot of slope).	19172	A	1	4.1	35.2	50.1	10.6	4.5	......	......	......	......	2.1	6,983	12,570	1,960	Do.
Same (face of 8 room, 12 rise, 6 east entry, 8,000 feet from foot of slope).	19173	A	1	4.0	36.6	46.3	13.1	3.1	......	......	......	......	2.1	6,706	12,070	2,070	Do.
Same (rib of 5 rise, 7 west entry, 1¼ miles from mine mouth).	19174	A	1	4.2	36.0	49.1	10.7	3.8	......	......	......	......	2.2	6,978	12,560	2,010	Do.
Same (composite of samples 19165 to 19174, inclusive).	19175	A	1	4.4	36.3	47.6	11.7	3.6	5.0	68.3	1.4	10.0	2.5	6,850	12,330	......	
			2	......	37.9	49.9	12.2	3.7	4.8	71.4	1.5	6.4	......	7,161	12,890	......	
			3	......	43.2	56.8	......	4.3	5.4	81.3	1.7	7.3	......	8,156	14,680	......	
One mile north of; Syre's mine, No. 10 bed (3 north entry, main entry, 550 feet northwest of mine mouth).	23012	A	1	5.3	35.5	48.4	10.8	4.0	......	......	......	......	3.2	6,883	12,390	2,010	Do.
			2	......	37.5	51.1	11.4	4.2	......	......	......	......	......	7,272	13,090	......	
Morganfield; one-half mile north of; Morganfield mine, No. 11 bed (face of 5 north entry, 2,400 feet from shaft).	19055	A	1	8.4	37.6	44.4	9.6	3.7	......	......	......	......	3.3	6,550	11,790	2,230	Do.
Same (face of 16 room, 3 south entry, 1,500 feet from shaft).	19056	A	1	7.9	38.1	44.2	9.8	4.0	......	......	......	......	3.3	6,578	11,840	1,840	Do.
Same (face of 30 room, 1 south entry, west main entry, 1,700 feet from shaft).	19057	A	1	7.5	38.4	42.2	11.9	4.5	......	......	......	......	3.3	6,389	11,500	1,930	Do.
Same (face of 28 room, 2 south entry, 1,800 feet from shaft.	19058	A	1	8.2	38.1	44.2	9.5	4.2	......	......	......	......	3.2	6,561	11,810	2,070	Do.
Same (composite of samples 19055 to 19058, inclusive).	19059	A	1	8.0	38.5	43.2	10.3	4.2	5.3	64.8	1.3	14.1	3.3	6,528	11,750	......	Do.
			2	......	41.8	47.0	11.2	4.5	4.8	70.5	1.5	7.5	......	7,094	12,770	......	
			3	......	47.0	53.0	......	5.1	5.4	79.3	1.6	8.6	......	7,989	14,380	......	
Spring Grove; 1 mile northeast of; Buchanan mine, No. 11 bed (300 feet southwest of shaft).	23013	A	1	8.7	37.4	44.8	9.1	3.7	......	......	......	......	5.2	6,600	11,880	1,990	Do.
			2	......	41.0	49.0	10.0	4.0	......	......	......	......	......	7,228	13,010	......	
Sturgis; 2½ miles southwest of; Bell slope mine No. 1 bed (100 feet north of mine mouth).	3678	B	1	7.5	30.7	57.2	4.6	1.0	......	......	......	......	5.1	7,494	13,490	......	U. S. Geological Survey, 1908.
			2	......	33.2	61.8	5.0	1.1	......	......	......	......	......	8,100	14,580	......	
Same (60 feet north of mine mouth)...	3679	B	1	8.1	30.1	56.6	5.2	1.1	......	......	......	......	5.7	......	......	......	Do.
			2	......	32.8	61.6	5.6	1.2	......	......	......	......	......	......	......	......	
Three and one-half miles northwest of; Crittenden mine, No. 6 bed (rib of lowest entry, main north entry, 800 feet from mine mouth).	19113	A	1	3.8	37.0	49.9	9.3	3.6	......	......	......	......	1.8	7,161	12,890	1,990	Bureau of Mines, 1918.
			2	......	38.5	51.8	9.7	3.8	......	......	......	......	......	7,444	13,400	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
UNION COUNTY—continued.																	
Sturgis; 2½ miles southwest of; Bell slope mine No. 1 bed (face of 22 room, 2 east entry, main north entry, 1,000 feet from mine mouth).	19114	A	1	4.4	37.9	51.0	6.7	2.2	......	......	......	......	2.5	7,411	13,340	2,260	Bureau of Mines, 1918.
Same (face of 18 room, 2 east entry, main north entry, 2,200 feet from mine mouth).	19115	A	1	4.4	37.1	49.6	8.8	2.7	......	......	......	......	2.3	7,222	13,000	2,140	Do.
Same (face of 20 room, 2 east entry, main north entry, 2,200 feet from mine mouth).	19116	A	1	4.5	36.9	49.8	8.8	3.0	......	......	......	......	2.3	7,200	12,960	2,120	Do.
Same (composite of samples 19114 to 19116, inclusive).	19356	A	1	4.5	36.6	50.7	8.2	2.6	5.4	72.3	1.6	9.9	2.4	7,233	13,020	....	Do.
			2	......	38.4	53.0	8.6	2.7	5.1	75.7	1.7	6.2	......	7,572	13,630	....	
			3	......	42.0	58.0	......	3.0	5.6	82.9	1.9	6.6	......	8,289	14,920	....	
Two miles northwest of; No. 8 mine, No. 9 bed (rib of 3 west entry, 850 feet from slope mouth).	19071	A	1	3.5	38.1	48.2	10.2	3.7	......	......	......	......	1.8	7,144	12,860	1,920	Do.
Same (face of 4 west air course, 1,800 feet from slope mouth).	19072	A	1	6.2	36.7	45.1	12.0	4.6	......	......	......	......	4.5	6,750	12,150	1,960	Do.
Same (rib of main slope entry, 2,000 feet from mine mouth).	19073	A	1	4.4	37.9	46.6	11.1	3.0	......	......	......	......	2.7	6,983	12,570	2,050	Do.
Same (face of 4 east level, 2,098 feet from slope mouth).	19074	A	1	4.0	36.3	48.9	10.8	4.2	......	......	......	......	2.1	7,028	12,650	2,020	Do.
Same (face of 3 east level, 2,000 feet from slope mouth).	19075	A	1	3.9	36.6	48.2	11.3	4.6	......	......	......	......	2.0	6,967	12,540	1,940	Do.
Same (composite of samples 19071 to 19075, inclusive).	19076	A	1	4.3	37.2	47.4	11.1	4.0	5.1	69.1	1.5	9.2	2.6	6,978	12,560	....	Do.
			2	......	38.9	49.5	11.6	4.2	4.9	72.2	1.6	5.5	......	7,294	13,130	....	
			3	......	44.0	56.0	......	4.7	5.5	81.8	1.8	6.2	......	8,256	14,860	....	
One and one-half miles northeast of; No. 9 mine, No. 9 bed (face of east entry, 135 feet from shaft).	19081	A	1	3.4	36.3	48.9	11.4	5.0	......	......	......	......	1.5	7,039	12,670	1,990	Do.
Same (face of main west entry, 400 feet from shaft).	19082	A	1	3.8	35.8	49.0	11.4	3.7	......	......	......	......	2.1	6,989	12,580	1,980	Do.
Same (face of main east entry, 450 feet from shaft).	19083	A	1	3.5	37.7	49.0	9.8	3.6	......	......	......	......	1.6	7,144	12,860	1,990	Do.
Same (75 feet northwest of shaft)......	19084	A	1	3.7	37.6	50.3	8.4	3.3	......	......	......	......	1.8	7,267	13,080	2,000	Do.

Same (composite of samples 19081 to 19084, inclusive).	19085	A	1	3.6	36.7	49.4	10.3	4.0	5.2	70.7	1.6	8.2	1.8	7,111	12,800	......	Do.
			2	......	38.1	51.2	10.7	4.1	4.9	73.3	1.6	5.4	......	7,372	13,270	......	
			3	......	42.6	57.4	......	4.6	5.5	82.1	1.8	6.0	......	8,256	14,860	......	
Uniontown; one and one-half miles from; River mine, No. 11 bed (face of main east entry, 1,400 feet from shaft).	18993	A	1	9.3	38.3	42.9	9.5	3.6	......	......	......	......	3.6	6,472	11,650	2,020	Do.
Same (face of main west entry, 1,330 feet from shaft).	18994	A	1	9.6	37.3	44.5	8.6	3.1	......	......	......	......	4.0	6,528	11,750	2,050	Do.
Same (face of 24 room, 1 south entry, east side, 1,285 feet from shaft).	18995	A	1	8.8	37.6	42.7	10.9	4.2	......	......	......	......	3.7	6,372	11,470	1,950	Do.
Same (face of 1 south entry, main west entry, 30 feet inby 22 room).	18996	A	1	9.4	38.0	44.6	8.0	3.4	......	......	......	......	4.0	6,583	11,850	1,940	Do.
Same (face of 3 south entry, 1,290 feet from shaft).	18997	A	1	9.4	37.5	43.3	9.8	3.6	......	......	......	......	3.6	6,433	11,580	1,880	Do.
Same (composite of samples 18993 to 18997, inclusive).	18998	A	1	9.3	37.8	43.6	9.3	3.6	5.5	64.3	1.3	16.0	3.8	6,478	11,660	......	Do.
			2	......	41.7	48.0	10.3	4.0	4.9	70.9	1.5	8.4	......	7,144	12,860	......	
			3	......	46.4	53.6	......	4.4	5.5	79.0	1.6	9.5	......	7,961	14,330	......	
Same	3159	D	4	7.2	39.9	46.0	6.9	3.2	......	......	......	......	......	*6961	12530	......	Kentucky Geological Survey, 1910.
			2	......	43.0	49.6	7.4	3.4	......	......	......	......	......	7500	13500	......	
Waverly; Kentucky No. 1 mine, No. 11 bed.	3068	D	4	3.3	39.6	41.6	15.5	4.7	......	......	......	......	......	*5956	10720	......	Do.
			2	......	41.0	42.9	16.1	4.9	......	......	......	......	......	6161	11090	......	Do.
Same, No. 2 mine	3069	D	4	3.7	39.8	46.4	10.1	3.9	......	......	......	......	......	*6511	11720	......	Do.
			2	......	41.3	48.2	10.5	4.0	......	......	......	......	......	6761	12170	......	Do.
WEBSTER COUNTY.																	
Clay; 1¼ miles northwest of; No. 7 mine, 12 bed (face of west dip entry, air course, 1,850 feet from shaft).	19148	A	1	5.7	36.1	50.7	7.5	2.0	......	......	......	......	2.9	7178	12920	2190	Bureau of Mines, 1918.
Same (neck of break through between 3 and 4 south entries, 2 right entry, 1,600 feet from shaft).	19149	A	1	5.2	36.2	52.2	6.4	1.3	......	......	......	......	2.4	7278	13100	2490	Do.
Same (face of 4 south entry, 2 left entry, 2,800 feet from shaft).	19150	A	1	6.4	34.5	49.2	9.9	1.1	......	......	......	......	3.4	6850	12330	2250	Do.
Same (face of 10 room, 1 left entry, west dip entry, 2,000 feet from shaft).	19151	A	1	5.7	35.4	52.0	6.9	1.2	......	......	......	......	2.5	7206	12970	2370	Do.
Same (face of 14 room, 1 south entry, 2 right entry, 1,600 feet from shaft).	19152	A	1	5.1	36.2	50.1	8.6	2.8	......	......	......	......	2.5	7094	12770	2080	Do.
Same (east break through, at face of 2 left entry, 3,000 feet from shaft).	19153	A	1	5.8	33.4	52.1	8.7	1.1	......	......	......	......	2.4	7000	12600	2290	Do.
Same (composite of samples 19148 to 19153, inclusive).	19154	A	1	5.6	35.0	51.3	8.1	1.6	5.3	71.5	1.5	12.0	2.7	7089	12760	......	Do.
			2	......	37.1	54.4	8.5	1.7	5.0	75.7	1.6	7.5	......	7506	13510	......	Do.
			3	......	40.6	59.4	......	1.8	5.5	82.8	1.7	8.2	......	8206	14770	......	
Same (face of 11 room, 14 south entry, 2 left entry, main rise).	30747	A	1	6.8	33.4	46.4	13.4	1.2	......	......	......	......	2.8	6506	11710	......	Bureau of Mines, 1922.
Same (face of 24 room, 3 left entry, east dip entry).	30748	A	1	4.6	36.6	51.6	7.2	1.1	......	......	......	......	1.3	7233	13020	2610	Do.
Same (face of 10 room, 2 south entry, 7 right east dip entry).	30749	A	1	4.5	35.3	50.0	10.2	1.0	......	......	......	......	1.3	6967	12540	2650	Do.
Same (face of 3 south entry, 3 left entry, main rise, 200 feet from 3 left entry).	30750	A	1	6.0	35.1	52.3	6.6	1.1	......	......	......	......	1.9	7167	12900	2720	Do.
Same (composite of samples 30747 to 30750, inclusive).	30751	A	1	5.4	34.9	50.4	9.3	1.1	5.1	70.4	1.6	12.5	1.8	6944	12500	......	Do.
			2	......	36.9	53.2	9.9	1.1	4.8	74.4	1.6	8.2	......	7339	13210	......	Do.
			3	......	40.9	59.1	......	1.2	5.3	82.5	1.8	9.2	......	8139	14650	......	

TABLE 1.—*Chemical analyses of mine samples*—Continued.

WESTERN KENTUCKY FIELD—Continued.

Locality, mine, etc.	Sample.			Proximate.				Ultimate.					Air-drying loss.	Calorific value.		Softening temperature (° F.).	Authority and year.
	Laboratory No.	Kind.	Condition.	Moisture.	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	Hydrogen.	Carbon.	Nitrogen.	Oxygen.		Calories.	British thermal units.		
WEBSTER COUNTY—continued																	
Providence; two-thirds mile north of; No. 3 mine, No. 9 bed (face of 8 room, 2 east entry, main north entry, 1,300 feet from shaft).	19141	A	1	5.6	37.2	47.3	9.9	4.3	.....	.....	.....	.....	2.9	6872	12370	1980	Bureau of Mines, 1918.
Same (face of 8 room, 2 west entry, main north entry, 1,200 feet from shaft).	19142	A	1	6.1	36.7	45.6	11.6	4.1	.....	.....	.....	.....	3.1	6639	11950	1870	Do.
Same (face of 14 room, 2 west entry, main north entry, 1,450 feet from shaft).	19143	A	1	5.6	37.9	48.3	8.2	2.7	.....	.....	.....	.....	2.8	7017	12630	2050	Do.
Same (face of 6 room, 3 west entry, main north entry, 1,500 feet from shaft).	19144	A	1	5.0	37.2	46.5	11.3	5.6	.....	.....	.....	.....	2.6	6778	12200	1980	Do.
Same (last break through in 19 room, 1 west entry, main north entry, 1,500 feet from shaft).	19145	A	1	5.5	36.5	47.4	10.6	3.6	.....	.....	.....	.....	2.5	6806	12250	2100	Do.
Same (face of main north entry, 1,500 feet from shaft).	19146	A	1	5.3	38.0	48.5	8.2	3.3	.....	.....	.....	.....	2.6	7067	12720	1960	Do.
Same (composite of samples 19141 to 19146, inclusive).	19147	A	1	5.6	37.2	47.2	10.0	3.9	5.2	68.1	1.4	11.4	2.8	6850	12330	.....	Do.
			2	.....	39.4	50.0	10.6	4.1	4.9	72.1	1.5	6.8	.....	7256	13060	.....	Do.
			3	.....	44.1	55.9	.....	4.6	5.5	80.7	1.7	7.5	.....	8122	14620	.....	
S. K. Luton's mine (face of 1 left entry)..	3084	D	4	3.3	36.3	51.0	9.4	4.4	.....	.....	.....	.....	.....	6811	12260	.....	Kentucky Geological Survey, 1910.
			2	.....	37.5	52.8	9.7	4.6	.....	.....	.....	.....	.....	7039	12670	.....	
Same (face of main entry)...........	3092	D	4	3.2	38.1	49.8	8.9	3.8	.....	.....	.....	.....	.....	7061	12710	.....	Do.
			2	.....	39.3	51.5	9.2	3.9	.....	.....	.....	.....	.....	7289	13120	.....	
One and one-half miles northeast of; Shamrock mine, No. 11 bed (face of 45 room, northwest entry, 2,700 feet from shaft).	19176	A	1	5.9	37.3	46.9	9.9	3.8	.....	.....	.....	.....	2.7	6756	12160	2010	Bureau of Mines, 1918.
Same (face of 8 room, 5 west entry, 2,000 feet from shaft).	19177	A	1	5.7	38.6	47.8	7.9	3.6	.....	.....	.....	.....	2.3	7006	12610	2110	Do.
Same (face of 24 room, 4 southeast entry, 3,000 feet from shaft).	19178	A	1	5.7	38.6	45.6	10.1	4.0	.....	.....	.....	.....	2.4	6744	12140	1960	Do.
Same (face of 29 room, 3 northwest entry, 2,600 feet from shaft).	19179	A	1	5.6	38.7	47.2	8.5	3.7	.....	.....	.....	.....	2.7	6950	12510	1960	Do.
Same (face of 7 northeast entry, 2,000 feet from shaft).	19180	A	1	5.8	38.5	47.2	8.5	3.6	.....	.....	.....	.....	2.3	6911	12440	1960	Do.

Same (face of 46 room, 1 southeast entry, 3,500 feet from shaft).	19181	A	1	5.5	38.8	46.9	8.8	3.9					2.6	6878	12380	1950	Do.
Same (last break through, 1 northeast entry, 2,100 feet from shaft).	19182	A	1	6.7	36.9	47.0	9.4	4.4					3.2	6756	12160	1930	Do.
Same (face of 5 northeast entry, 2,400 feet from shaft).	19183	A	1	5.6	37.0	46.8	10.6	4.9					2.5	6744	12140	1880	Do.
Same (face of 3 northeast entry, 2,400 feet from shaft).	19184	A	1	7.5	37.0	46.5	9.0	4.0					3.9	6739	12130	1990	Do.
Same (composite of samples 19176 to 19184, inclusive).	19195	A	1	6.0	37.9	46.8	9.3	4.0	5.3	68.2	1.3	11.9	2.7	6828	12290		Do.
			2		40.3	49.8	9.9	4.2	4.9	72.6	1.4	7.0		7261	13070		Do.
			3		44.7	55.3		4.7	5.4	80.5	1.5	7.9		8061	14510		
Same (face of 2 west entry)	3082	D	4	3.7	40.4	49.9	6.0	2.7						7222	13000		Kentucky Geological Survey, 1910.
			2		41.9	51.9	6.2	2.8						7494	13490		
Same (face of south entry)	3087	D	4	3.7	40.5	50.9	4.9	2.8						7428	13370		Do.
			2		42.0	52.9	5.1	2.9						7711	13880		
Sebree; one-half mile of; Sebree mine, No. 9 bed (last room, air course, 2 north entry, main east entry, 1,400 feet from shaft).	18967	A	1	10.7	37.0	43.3	9.0	3.1					3.1	6400	11520	2020	Bureau of Mines, 1918.
Same (face of 2 north entry, main east entry, 1,600 feet from shaft).	18968	A	1	9.7	37.1	42.3	10.9	3.8					2.5	6233	11220	1810	Do.
Same (composite of samples 18967 and 18968).	18969	A	1	10.1	37.1	42.9	9.9	3.5	5.4	63.2	1.4	16.6	2.8	6317	11370		Do.
			2		41.3	47.7	11.0	3.9	4.8	70.3	1.5	8.5		7028	12650		Do.
			3		46.4	53.6		4.3	5.3	79.1	1.7	9.6		7900	14220		
Same	2668	D	4	8.9	40.6	45.5	5.0	2.3						*7061	12710		Kentucky Geological Survey, 1910.
			2		44.6	49.9	5.5	2.5						7750	13950		
Wheatcroft: Wheatcroft mine, No. 11 bed (face of 8 room, west shaft entry).	1382	B	1	4.6	38.2	49.8	7.4	3.3					2.6	7144	12860		U. S. Geological Survey, 1906.
			2		40.0	52.2	7.8	3.5						7489	13480		
Same (face of 2 west entry)	1384	B	1	4.8	39.7	48.5	7.0	3.2					2.0				Do.
			2		41.7	50.9	7.4	3.4									
No. 4 mine, No. 11 bed (face of 64 room, 5 west entry, 5,100 feet from mine mouth).	19119	A	1	4.2	38.2	46.2	11.4	4.1					2.1	6950	12510	2080	Bureau of Mines, 1918.
Same (face of 14 room, 6 west entry, 3,000 feet from mine mouth).	19120	A	1	5.0	36.8	48.9	9.3	3.9					2.8	7083	12750	2390	Do.
Same (left rib of 5 west entry, 5,100 feet from mine mouth).	19121	A	1	4.2	38.5	48.5	8.8	3.8					2.0	7161	12890	2100	Do.
Same (face of 4 west entry, 5,000 feet from mine mouth).	19122	A	1	3.8	37.8	48.1	10.3	4.0					1.8	7056	12700	2210	Do.
Same (face of 6 east air course, 2,800 feet from mine mouth).	19123	A	1	4.2	37.4	48.2	10.2	4.0					1.4	7039	12670	2020	Do.
Same (composite of samples 19119 to 19123, inclusive).	19124	A	1	4.3	38.1	47.5	10.1	4.0	5.2	69.5	1.4	9.8	2.0	7039	12670		Do.
			2		39.8	49.7	10.5	4.2	5.0	72.6	1.5	6.2		7356	13240		Do.
			3		44.4	55.6		4.7	5.5	81.1	1.7	7.0		8222	14800		
One and one-fourth miles east of; No. 5 mine, No. 11 bed (face of 5 room, 1 south heading, east entry, 500 feet from mine mouth).	7441	B	1	6.3	32.0	54.1	7.6	1.4	5.5	69.8	1.4	14.3	4.5	7150	12870		U. S. Geological Survey, 1913.
			2		34.1	57.8	8.1	1.4	5.1	74.5	1.5	9.5		7633	13740		
			3		37.1	62.9		1.6	5.6	81.0	1.6	10.2		8306	14950		
Wheatcroft mine, West Kentucky, colliery G (composite of samples from head of west entry and 11 room, main west entry).	2788	D	4	1.2	37.9	51.2	9.7	3.9						*7061	12710		Kentucky Geological Survey, 1910.
			2		38.4	51.8	9.8	4.0						7144	12860		

TABLE 2.—*Analyses of*

Where mined.			Commercial name of coal.	Size of coal.	Approximate tons delivered.
County and town.	Mine.	Bed.			
Bell County.					
Amru	Crane Creek		Crane Creek	Run of mine	1,439
Arjay	Glendon	Straight Creek		Lump, over 4-inch round screen.	200
Do	do	do		Egg, 2 by 4 inch round screen.	50
Do	do	do		Nut and slack through 2-inch round screen.	200
Balkan	Balkan	Creech		Lump, over 4-inch round and 4-inch bar screens.	350
Do	do	do		Egg, 2 by 4 inch bar screen.	450
Do	do	do		Nut and slack, through 2-inch round screen.	450
Blanche	Blanche	Straight Creek	Straight Creek	Lump	156
Do	do	do	do	Run of mine	793
Cardinal	Cardinal No. 1.	Harlan		do	200
Do	do	do		do	200
Do	do	do		Nut and slack, through ⅞ to 1½ inch bar screen.	25
Cary	Cary	Straight Creek		Lump, over 4-inch round screen.	200
Do	do	do		Run of mine, through 4-inch round screen.	250
Colmar	Amru	Mason		Run of mine	600
Logmont	Crystal	Poplar Lick		Lump, over 4-inch round screen.	50
Do	do	do		Egg (washed), 2 by 4 inch round screen.	35
Do	do	do		Nut and slack (washed), through 2-inch round screen.	85
Pineville	Arcadia	Straight Creek		Run of mine	300
Do	Straight Creek	do		do	100
Do	Moss Creek		Straight Creek, Jellico.	Lump	137
Ralston	Atlas	Hignite		Lump, over 4-inch round screen.	50
Do	do	do		Egg, 2 by 4 inch round screen.	35
Do	do	do		Nut and slack, through 2-inch round screen.	100
Do	Pinnacle	Poplar Lick		Lump, over 4-inch round screen.	50
Do	do	do		Egg, 2 by 4 inch round screen.	50
Do	do	do		Nut and slack (washed), through 2-inch round screen.	50
Rim	Black Raven	Straight Creek		Run of mine	844
Shamrock	Nos. 1 and 2	Klondike and Sandstone Parting.		Lump, over 4-inch round screen.	125
Do	do	do		Egg, 2 by 4 inch round screen.	75
Do	do	do		Nut and slack, through 2-inch round screen.	225
Straight Creek	Barker	Straight Creek	Straight Creek	Nut and slack, through 2½-inch screen.	1,559
Do	Straight Creek No. 2.	do		Run of mine	23
Do	do	do		do	12
Do	do	do		Slack, through 1¼-inch screen.	.....

delivered coal.

As received, moisture.	Proximate analysis.				Calorific value, per pound.						Number of analyses averaged.	Place of delivery.	Dates of delivery.
	Moisture-free coal.				As received.		Moisture-free.		Moisture-free and ash-free.				
	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	British thermal units.	Calories.	British thermal units.	Calories.	British thermal units.	Calories.			
2.9	36.3	54.6	9.1	1.4	13,250	7,361	13,650	7,583	15,020	8,344	15	Fort Dade, Fla....	1916–17
3.2	41.6	56.8	1.6	.8	14,330	7,961	14,800	8,222	15,040	8,356	1	Tipple............	8/ 3/21
2.7	39.6	58.2	2.2	.8	14,260	7,922	14,660	8,144	14,990	8,328	1	.....do............	8/ 5/21
3.2	37.7	57.1	5.2	1.0	13,710	7,617	14,160	7,867	14,940	8,300	1	.....do............	8/ 5/21
1.7	39.4	56.9	3.7	.8	14,270	7,928	14,520	8,067	15,080	8,378	1	.....do............	7/29/21
1.8	39.1	55.6	5.3	1.0	13,980	7,767	14,240	7,911	15,040	8,356	1	.....do............	7/28/21
2.1	36.9	54.3	8.8	1.0	13,360	7,422	13,650	7,583	14,970	8,317	1	.....do............	7/28/21
2.4	37.9	58.1	4.0	1.1	14,190	7,883	14,540	8,078	15,150	8,417	6	Courthouse and post office, Memphis, Tenn.	1910–11
2.3	36.9	52.9	10.2	.8	13,210	7,339	13,520	7,511	15,060	8,367	4	Fort McPherson, Ga.	1912–13
2.6	36.9	58.3	4.8	.8	13,990	7,772	14,360	7,978	15,080	8,378	1	Tipple............	10/ 7/21
4.1	37.6	56.2	6.2	.9	13,500	7,500	14,080	7,822	15,010	8,339	1	.....do............	8/ 2/21
2.4	37.2	55.7	7.1	.9	13,570	7,539	13,900	7,722	14,960	8,311	1	.....do............	8/ 2/21
1.8	40.0	55.7	4.3	.9	14,080	7,822	14,340	7,967	14,980	8,322	1	.....do............	8/ 4/21
2.6	38.1	56.0	5.9	.9	13,770	7,650	14,140	7,856	15,030	8,350	1	.....do............	8/ 4/21
1.7	38.6	55.2	6.2	1.6	13,890	7,717	14,130	7,850	15,060	8,367	1	.....do............	8 9/21
1.5	38.4	53.3	8.3	2.8	13,480	7,489	13,690	7,606	14,930	8,294	1	.....do............	8/ 2/21
2.8	39.2	51.5	9.3	2.7	13,200	7,333	13,580	7,544	14,970	8,317	1	.....do............	8/ 3/21
7.5	38.4	49.5	12.1	3.0	12,030	6,683	13,000	7,222	14,790	8,217	1	.....do............	8/ 3/21
1.9	36.4	53.1	10.5	.7	13,040	7,244	13,290	7,383	14,850	8,250	1	.....do............	7/26/21
2.3	38.1	57.5	4.4	1.1	14,100	7,833	14,430	8,017	15,090	8,383	1	.....do............	9/ 9/21
2.4	40.2	56.8	3.0	.9	14,270	7,928	14,620	8,122	15,070	8,372	4	Post office, Memphis, Tenn.	1913–14
2.7	38.6	56.8	4.6	.5	13,790	7,661	14,170	7,872	14,850	8,250	1	Tipple............	8/ 4/21
3.0	38.8	56.0	5.2	.6	13,660	7,589	14,080	7,822	14,850	8,250	1	.....do............	8/ 4/21
4.5	34.7	53.0	12.3	.9	12,400	6,889	12,980	7,211	14,800	8,222	1	.....do............	8/12/21
1.6	41.1	53.5	5.4	3.0	13,990	7,772	14,220	7,900	15,030	8,350	1	.....do............	8/ 9/21
1.7	41.1	52.1	6.8	3.2	13,660	7,589	13,900	7,722	14,910	8,283	1	.....do............	8/ 9/21
7.3	39.8	48.6	11.6	2.9	12,210	6,783	13,170	7,317	14,900	8,278	1	.....do............	8/ 5/21
5.1	36.1	55.0	8.9	1.0	12,960	7,200	13,660	7,589	14,990	8,328	14	Courthouse and post office, Louisville, Ky.	1911–12
2.2	38.3	54.7	7.0	2.1	13,610	7,561	13,920	7,733	14,970	8,317	1	Tipple............	9/22/21
2.2	36.8	53.2	10.0	1.7	13,060	7,256	13,350	7,417	14,830	8,239	1	.....do............	9/22/21
3.0	33.6	50.2	16.2	2.4	11,980	6,656	12,350	6,861	14,740	8,189	1	.....do............	9/22/21
3.5	33.8	54.8	11.4	1.6	12,790	7,106	13,250	7,361	14,950	8,306	28	Courthouse and post office, Louisville, Ky.	1910–11
3.1	37.3	58.2	4.5	1.3	14,150	7,861	14,600	8,111	15,290	8,494	1	St. Louis fuel testing plant.	1904
3.0	36.7	57.3	6.0	1.2	......	......	......	......	......	......	1	.....do............	1904
5.2	35.3	56.0	8.7	1.2	13,220	7,344	13,940	7,744	15,270	8,483	1	.....do............	1905

Original from PRINCETON UNIVERSITY

Table 2.—*Analyses of*

Where mined.			Commercial name of coal.	Size of coal.	Approximate tons delivered.
County and town.	Mine.	Bed.			
Christian County.					
Mannington	Williams	Empire		**Run of mine**	600
Harlan County.					
Ages	Harlan Collieries.	Harlan		Lump, over 4½-inch round and 3½-inch bar screens.	250
Do	do	do		Egg, 1½ by 4½ inch round and 3½-inch bar screens.	200
Do	do	do		Nut and slack, through 1½-inch round screen.	200
Big Black Mountain.	Prospect Pit	High Splint		Run of mine	
Chevrolet	Chevrolet Nos. 1 and 2.	Harlan		Lump, over 4-inch bar screen.	200
Do	do	do		Run of mine, through 4-inch bar screen.	550
Coalgood	Mary Helen	do		Lump, over 3½-inch round screen.	350
Do	do	do		Egg, 2 by 3½ inch round screen.	200
Do	do	do		Nut and slack, through 2-inch round screen.	450
Coburn	Mill Creek	Smith or Mill Creek.		Lump, over 4-inch round screen.	250
Do	do	do		Egg, 2 by 4 inch round screen.	200
Do	do	do		Nut and slack, through 2-inch round screen.	400
Coxton	Coxton	Harlan		Run of mine	650
Do	Kay U	do		do	500
Evarts	Harlan Cooperative.	Darby		do	150
Harlan	Tway	Harlan		Lump, over 4-inch round screen.	300
Do	do	do		Egg, 2 by 4 inch round screen.	150
Do	do	do		Nut and slack, through 2-inch round screen.	300
High Splint	Harlan	do		Run of mine	400
Do	High Splint	High Splint		Lump, over 4-inch bar screen.	300
Do	do	do		Egg, 2-inch round by 4-inch bar screens.	150
Do	do	do		Nut and slack, through 2-inch round screen.	200
Kitts	Clover Fork	Harlan		Lump, over 2-inch bar screen.	400
Do	do	do		Egg, 2-inch round by 2-inch bar screens.	150
Do	do	do		Nut and slack, through 2-inch round screen.	350
Do	Golden Ash	do		Lump, over 6-inch round and 4-inch bar screens.	100
Do	do	do		Run of mine, through 6-inch round and 4-inch bar screens.	600
Do	Rex	do		Lump, over 4-inch round screen.	150
Do	do	do		Egg, 2 by 4 inch round screen.	150
Do	do	do		Nut and slack, through 2-inch round screen.	200
Liggett	Bowling	Harlan		Run of mine	125
Do	Liggett	do		Lump, over 3-inch bar screen.	75

delivered coal—Continued.

As received, moisture.	Proximate analysis.				Calorific value, per pound.						Number of analyses averaged.	Place of delivery.	Dates of delivery.
	Moisture-free coal.				As received.		Moisture-free.		Moisture-free and ash-free.				
	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	British thermal units.	Calories.	British thermal units.	Calories.	British thermal units.	Calories.			
9.1	38.6	50.5	10.9	3.4	11,800	6,556	12,980	7,211	14,570	8,094	3	Tipple............	1/23–27/19
2.1	39.1	56.6	4.3	1.0	14,010	7,783	14,310	7,950	14,950	8,306	1	.....do............	8/29/21
2.1	38.4	55.4	6.2	1.0	13,760	7,644	14,060	7,811	14,990	8,328	1	.....do............	8/26/21
2.4	36.6	55.9	7.5	1.1	13,490	7,494	13,820	7,678	14,940	8,300	1	.....do............	8/26/21
4.4	36.6	59.5	3.9	.7	13,920	7,733	14,560	8,089	15,150	8,417	1	St. Louis fuel-testing plant.	1905
2.4	39.3	57.6	3.1	.8	14,250	7,917	14,600	8,111	15,070	8,372	1	Tipple............	8/18/21
2.7	37.8	56.1	6.1	.8	13,720	7,622	14,100	7,833	15,020	8,344	1	.....do............	8/18/21
2.2	39.3	57.6	3.1	1.0	14,240	7,911	14,560	8,089	15,030	8,350	1	.....do............	8/27/21
2.0	40.2	56.5	3.3	.9	14,190	7,883	14,480	8,044	14,970	8,317	1	.....do............	8/29/21
2.4	38.2	55.4	6.4	1.0	13,670	7,594	14,010	7,783	14,970	8,317	1	.....do............	8/29/21
2.9	36.5	56.1	7.4	.7	13,130	7,294	13,520	7,511	14,600	8,111	1	.....do............	8/24/21
2.6	37.2	54.2	8.6	.9	13,030	7,239	13,380	7,433	14,640	8,133	1	.....do............	8/26/21
3.1	36.1	53.8	10.1	1.1	12,670	7,039	13,080	7,267	14,550	8,083	1	.....do............	8/24/21
2.2	38.4	56.2	5.4	.9	13,840	7,689	14,150	7,861	14,960	8,311	1	.....do............	8/23/21
2.4	38.7	55.5	5.8	.9	13,780	7,656	14,120	7,844	14,990	8,328	1	.....do............	8/24/21
2.0	38.6	55.1	6.3	.8	13,670	7,594	13,950	7,750	14,890	8,272	1	.....do............	8/30/21
2.3	39.2	57.6	3.2	.7	14,220	7,900	14,550	8,083	15,030	8,350	1	.....do............	8/16/21
2.1	39.3	57.3	3.4	.7	14,260	7,922	14,570	8,094	15,080	8,378	1	.....do..........,..	8/15/21
2.3	36.5	58.1	5.4	.7	13,920	7,733	14,250	7,917	15,060	8,367	1	.....do............	8/15/21
1.8	38.3	54.2	7.5	1.2	13,520	7,511	13,770	7,650	14,890	8,272	1	.....do............	9/ 2/21
4.0	36.8	58.5	4.7	.7	13,620	7,567	14,190	7,883	14,890	8,272	1	.....do............	10/ 3/21
3.4	37.5	56.4	6.1	.8	13,420	7,456	13,890	7,717	14,790	8,217	1	.....do............	10/ 5/21
4.0	35.6	53.1	11.3	.9	12,410	6,894	12,930	7,183	14,580	8,100	1	.....do............	10/ 5/21
2.4	39.2	57.8	3.0	.7	14,280	7,933	14,630	8,128	15,080	8,378	1	.....do............	8/16/21
2.1	37.9	56.7	5.4	.7	13,900	7,722	14,200	7,889	15,010	8,339	1	.....do............	8/18/21
2.6	36.9	56.1	7.0	.8	13,500	7,500	13,860	7,700	14,900	8,278	1	.....do............	8/18/21
2.3	38.5	57.6	3.9	.8	14,120	7,844	14,450	8,028	15,040	8,356	1	.....do............	8/25/21
2.9	36.9	56.1	7.0	.8	13,540	7,522	13,940	7,744	14,990	8,328	1	.....do............	8/19/21
2.2	38.4	58.1	3.5	.8	14,190	7,883	14,510	8,061	15,040	8,356	1	.....do............	8/17/21
2.1	39.3	56.1	4.6	.9	14,020	7,789	14,320	7,956	15,010	8,339	1	.....do............	8/15/21
2.4	37.1	54.2	8.7	.9	13,290	7,383	13,620	7,567	14,920	8,289	1	.....do............	8/15/21
3.1	35.8	59.8	4.4	.8	13,960	7,756	14,410	8,006	15,070	8,372	1	Tipple............	9/27/21
2.4	39.1	58.5	2.4	.7	14,320	7,956	14,670	8,150	15,030	8,350	1	.....do............	8/22/21

TABLE 2.—*Analyses of*

Where mined.			Commercial nome of Coal.	Size of coal.	Approximate tons delivered.
County and town.	Mine.	Bed.			
Christian County—Continued.					
Liggett	Liggett	Harlan		Egg, 1½-inch around by 3-inch bar screens.	50
Do	do.	do.		Nut and slack, through 1½-inch round screen.	75
Do	Mahan-Ellison	do.		Run of mine	50
Shields	Berger No. 1.	do.		do.	450
Twila	Creech Nos. 1 and 2.	Wallins		Lump, over 4-inch round and 3-inch bar screens.	600
Do	do.	do.		Egg, 2-inch round by 3-inch bar screen.	350
Do	do.	do.		Nut and slack, through 2-inch round screen.	400
	Kenton		Kenton	Nut and slack, through 2-inch screen.	5,681
Hopkins County.					
Barnsley	Barnsley	No. 9		Lump and nut, over ⅞-inch screen.	17
Do	do.	do.		Run of mine	12
Earlington	No. 11	No. 11		Lump and nut, over ⅞-inch screen.	20
Do	do.	do.		Nut and slack, through ⅞-inch screen.	5
St. Charles	St. Charles	No. 9		Run of mine	1,416
Johnson County.					
Paintsville	Miller Creek country bank.	Miller Creek		do.	
Knox County.					
Anchor	Anchor	Dean		Lump, over 3-inch bar screen.	75
Do	do.	do.		Run of mine, through 3-inch bar screen.	75
Trosper	Trosper	do.		Lump, over 4-inch bar screen.	150
Do	do.	do.		Run of mine, through 4-inch bar screen.	150
Mc Creary County.					
Shoapman	"A"	No. 1		Run of mine	1,050
Worley	No. 4	No. 1½		Lump, over 4-inch round screen.	550
Do	do.	do.		Egg, 2 by 4 inch round screen.	200
Do	do.	do.		Nut and slack, through 2-inch round screen.	250
Yamacraw	No. 11	do.		Lump, over 4-inch round screen.	300
Do	do.	do.		Egg, 2 by 4 inch round screen.	200
Do	do.	do.		Nut and slack, through 2-inch round screen.	300
Muhlenberg County.					
Central City	Central	No. 9		Lump, over 1½-inch bar screen.	
Drakesboro	Diamond Block.	do.		Run of mine	274
Mercer				Lump, over 2½-inch screen.	5,119

delivered coal—Continued.

As received, moisture.	Proximate analysis.				Calorific value, per pound.						Number of analyses averaged.	Place of delivery.	Dates of delivery.
	Moistuae-free coal.				As received.		Moisture-free.		Moisture-free and ash free.				
	Nolatile matter.	Fixed carbon.	Ash.	Sulphur.	British thermal units.	Calories.	British thermal units.	Calories.	British thermal units.	Calories.			
2.5	38.5	58.0	3.5	.7	14,080	7,822	14,440	8,022	14,960	8,311	1	Tipple	8/23/21
3.7	34.7	55.9	9.4	.8	12,980	7,211	13,480	7,489	14,880	8,267	1	do	8/22/21
2.9	36.7	57.4	5.9	.8	13,680	7,600	14,090	7,828	14,970	8,317	1	do	9/30/21
2.4	38.7	55.2	6.1	.9	13,700	7,611	14,040	7,800	14,950	8,306	1	do	9/1/21
2.2	38.2	58.7	3.1	.7	13,980	7,767	14,290	7,939	14,750	8,194	1	do	9/1/21
2.2	41.3	55.0	3.7	.7	13,900	7,722	14,210	7,894	14,760	8,200	1	do	9/2/21
2.3	38.9	52.6	8.5	1.5	13,110	7,283	13,420	7,456	14,670	8,150	1	do	9/2/21
4.5	35.4	55.7	8.9	.9	12,990	7,217	13,600	7,556	14,930	8,294	15	National Home for Disabled Volunteer Soldiers, Indiana.	1916–17
7.8	40.2	51.2	8.6	3.6	......	......	......	......	......	......	1	St. Louis fuel-testing plant.	1904
7.9	39.2	49.9	10.9	3.8	12,030	6,683	13,060	7,256	14,660	8,144	1	do	1904
7.9	41.2	48.9	9.9	3.9	12,200	6,778	13,250	7,361	14,710	8,172	1	do	1904
9.5	36.8	43.7	19.5	4.9	......	......	......	......	......	......	1	do	1904
8.0	......	......	13.8	....	11,450	6,361	12,450	6,917	14,440	8,022	17	Courthouse and post office, Louisville, Ky.	1907–08
5.1	38.5	58.6	2.9	.6	13,750	7,639	14,490	8,050	14,920	8,289	1	St. Louis fuel-testing plant.	1905
3.7	39.8	55.1	5.1	1.0	13,540	7,522	14,060	7,811	14,820	8,233	1	Tipple	7/26/21
3.5	37.9	52.1	10.0	.9	12,750	7,083	13,210	7,339	14,680	8,156	1	do	7/26/21
2.3	39.6	55.3	5.1	.8	13,740	7,633	14,060	7,811	14,820	8,233	1	do	7/28/21
2.9	35.7	50.4	13.9	.8	12,150	6,750	12,510	6,950	14,530	8,072	1	do	7/28/21
2.9	36.9	52.0	11.1	2.1	12,760	7,089	13,140	7,300	14,780	8,211	1	do	10/20/21
3.0	39.1	56.9	4.0	.6	13,900	7,722	14,330	7,961	14,930	8,294	1	do	10/17/21
3.7	37.2	57.9	4.9	.6	13,660	7,589	14,180	7,878	14,910	8,283	1	do	10/17/21
4.1	34.1	54.3	11.6	.6	12,410	6,894	12,940	7,189	14,640	8,133	1	do	10/17/21
3.6	38.6	54.4	7.0	.5	13,380	7,433	13,880	7,711	14,920	8,289	1	do	10/18/21
3.5	36.0	56.9	7.1	.6	13,350	7,417	13,830	7,683	14,890	8,272	1	do	10/18/21
4.1	34.9	55.3	9.8	.7	12,770	7,094	13,320	7,400	14,770	8,206	1	do	10/18/21
8.5	38.5	51.1	10.4	3.9	11,990	6,661	13,100	7,278	14,620	8,122	1	St. Louis fuel-testing plant.	1905
9.8	43.3	44.2	12.5	3.8	11,370	6,317	12,600	7,000	14,400	8,000	4	Jeffersonville depot, Ind.	1913–14
7.4	39.1	49.8	11.1	3.8	11,950	6,639	12,900	7,167	14,510	8,061	38	Camp Knox, Ky.	1919–20

TABLE 2.—*Analyses of*

Where mined.			Commercial name of coal.	Size of coal.	Approximate tons delivered.
County and town.	Mine.	Bed.			
Ohio County.					
Beaver Dam or McHenry.	Taylor	No. 9	**Taylor**	Run of mine	481
McHenry	Broadway	do		do	
Do	do	do		Nut, over ⅜-inch and through 1⅛-inch screens.	
Pike County.					
Hellier	Edgewater	Upper Elkhorn.		Run of mine	150
Union County.					
Dekoven		No. 9	Cypress Creek	do	
Sturgis	Bell Slope	No. 1		do	
Do	Nos. 1, 2, and 8.	No. 9	Tradewater	do	4,534
Do	Nos. 1, 2, 8, and 9.	do	do	do	5,994
Do	do	do	do	Lump	10,017
Do	do	do	do	do	
Do	do	do	do	Pea and slack	6,652
Do	do	do	do	Run of mine	4,394
Do	do	do	do	do	
Webster County.					
Clay	No. 7	No. 12	Caney Creek	do	401
Wheatcroft	Wheatcroft	No. 11		do	23
Do	West Kentucky.			do	282
Do	do			Lump over 2½-inch screen	1,000
Whitley County.					
Burk Hollow	Burk Hollow	Blue Gem	Burk Hollow	Run of mine	552
Mountain Ash	Mountain Ash.	Jellico	Mountain Ash.	Lump	877

delivered coal—Continued.

As received, moisture.	Proximate analysis.				Calorific value, per pound.						Number of analyses averaged.	Place of delivery.	Dates of delivery.
	Moisture-free coal.				As received.		Moisture-free.		Moisture-free and ash-free.				
	Volatile matter.	Fixed carbon.	Ash.	Sulphur.	British thermal units.	Calories.	British thermal units.	Calories.	British thermal units.	Calories.			
8.4	40.0	49.5	10.5	2.8	11,900	6,611	12,990	7,217	14,510	8,061	3	Jeffersonville depot, Ind.	1915–16
8.0	35.5	53.6	10.9	3.2	12,030	6,683	13,080	7,267	14,680	8,156	1	St. Louis fuel-testing plant.	1906
8.7	38.3	51.9	9.8	3.4	12,080	6,711	13,230	7,350	14,670	8,150	1	.....do.............	1906
1.9	36.2	61.0	2.8	.6	14,710	8,172	14,990	8,328	15,420	8,567	1	Railroad cars at mine.	3/28/11
5.9	36.4	50.2	13.4	3.6	11,890	6,606	12,640	7,022	14,600	8,111	43	Engineers, St. Louis, Mo.	1916–17
5.5	32.8	58.8	8.4	1.3	13,230	7,350	14,000	7,778	15,280	8,489	1	St. Louis fuel-testing plant.	1906
3.7	38.4	51.0	10.6	2.8	12,740	7,078	13,230	7,350	14,800	8,222	5	Engineers, Greenville and Vicksburg, Miss.	1913–14
3.8	38.4	51.2	10.4	2.8	12,780	7,100	13,290	7,383	14,830	8,239	6	Engineers, White River, Ark.; Greenville and Vicksburg, Miss.	1914–15
4.1	36.8	52.8	10.4	2.1	12,680	7,044	13,220	7,344	14,750	8,194	8	Mississippi River Commission.	1915–16
4.6	36.1	54.5	9.4	1.2	12,770	7,094	13,390	7,439	14,780	8,211	8	.....do.............	1916–17
3.9	37.0	51.2	11.8	2.9	12,480	6,933	12,990	7,217	14,730	8,183	19	.....do.............	1916–17
4.0	36.7	52.7	10.6	1.7	12,620	7,011	13,150	7,306	14,710	8,172	9	Third Mississippi River Dist.	1916–17
5.8	36.8	50.0	13.2	4.0	11,980	6,656	12,720	7,067	14,650	8,139	7	Engineers, St. Louis, Mo.	1916–17
4.7	36.5	52.6	10.9	1.6	12,550	6,972	13,170	7,317	14,780	8,211	2	Jeffersonville depot, Ind.	1914–15
5.3	37.0	48.0	15.0	4.8	11,940	6,633	12,610	7,006	14,840	8,244	1	St. Louis fuel-testing plant.	1904
4.2	34.3	55.5	10.2	1.5	12,670	7,039	13,230	7,350	14,730	8,183	5	Fort Logan H, Roots, Ark.	1919–20
4.5	36.7	54.2	9.1	1.2	12,750	7,083	13,350	7,417	14,690	8,161	9	Fort Sam Houston, Tex.	1919–20
4.0	36.7	56.1	7.2	.8	13,340	7,411	13,900	7,722	14,980	8,322	3	Fort McPherson, Ga.	1913–14
2.8	39.1	55.7	5.2	1.0	13,890	7,717	14,290	7,939	15,070	8,372	4	.....do.............	1913–14

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